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TRANSONIC AERODYNAMIC CHARACTERISTICS OF THE VIKING ENTRY AND LANDER CONFIGURATIONS

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • WASHINGTON, D. C. • SEPTEMBER 1971

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TM X-2354		
4. Title and Subtitle TRANSONIC AERODYNAMIC CHARACTERISTICS OF THE VIKING ENTRY AND LANDER CONFIGURATIONS		5. Report Date September 1971 6. Performing Organization Code
7. Author(s) Robert J. McGhee, Paul M. Siemers III, and Richard E. Pelc		8. Performing Organization Report No. L-7849
9. Performing Organization Name and Address NASA Langley Research Center Hampton, Va. 23365		10. Work Unit No. 815-20-09-08 11. Contract or Grant No.
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D.C., 20546		13. Type of Report and Period Covered Technical Memorandum 14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

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17. Key Words (Suggested by Author(s))	18. Distribution Statement
Viking Space vehicle Blunt body	Unclassified – Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	51	$3.00

*For sale by the National Technical Information Service, Springfield, Virginia 22151

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SUMMARY

A wind-tunnel investigation of 0.08-scale models of the proposed Viking configuration has been conducted to determine the subsonic and transonic aerodynamic characteristics. Force and moment data were obtained on the entry vehicle, the aeroshell, and the lander plus base cover. In addition, pressure distributions on the lander plus base cover were obtained at model roll angles of 0°, -60°, -120°, and -180°. The investigation was conducted at Mach numbers from 0.40 to 1.20 for an angle-of-attack range from about -1° to 24°. The Reynolds number, based on maximum body diameter, varied from 0.74×10^{6} to 1.84×10^{6}.

The results indicate that all configurations are statically stable throughout the Mach number and angle-of-attack range tested; however, some nonlinearities are indicated. Removing the base cover from the entry vehicle to form the aeroshell eliminates the nonlinear variation of normal-force coefficient with angle of attack and results in positive normal-force-curve slopes at all Mach numbers and angles of attack. Both the entry vehicle and the lander plus base cover exhibit nonlinear variations of normal-force-curve slope at low angles of attack and both positive and negative slopes occur dependent upon Mach number and angle of attack. The lander plus base cover which is axially unsymmetrical indicates only minor variations in the basic stability parameters as a function of roll orientation.

INTRODUCTION

The Viking missions are part of a group of missions directed toward the exploration of the planet Mars. Environmental uncertainties in the Martian atmosphere necessitate that design considerations for the Viking entry vehicle and lander encompass a large range of aerodynamic conditions. Experimental investigations are required to provide basic aerodynamic data because of the uncertainty of analytical methods for predicting the aerodynamic characteristics at transonic speeds. The experimental determination of the

aerodynamic coefficients at transonic speeds is required to provide the input data necessary for trajectory analysis and for mission and subsystem design.

The investigation was conducted at Mach numbers from 0.40 to 1.20 and over an angle-of-attack range from -1^{o} to 24^{o}. The Reynolds number, based on the maximum diameter of the model, varied from 0.74×10^{6} to 1.84×10^{6}.

SYMBOLS

The aerodynamic coefficients presented herein are referred to the body-axes system. The moment reference centers, measured from the theoretical nose apex, for models of the entry vehicle, the aeroshell, and the lander plus base cover, are 23 percent of the maximum body diameter. All coefficients are based on the maximum base area and maximum base diameter.

C_A	axial-force coefficient, $\frac{\text{Axial force}}{qS}$
C_l	rolling-moment coefficient, $\frac{\text{Rolling moment}}{qSd}$
C_m	pitching-moment coefficient, $\frac{\text{Pitching moment}}{qSd}$
C_{m_α}	slope of pitching-moment-coefficient curve, $\frac{\partial C_m}{\partial \alpha}$, per deg
C_N	normal-force coefficient, $\frac{\text{Normal force}}{qS}$
C_{N_α}	slope of normal-force-coefficient curve, $\frac{\partial C_N}{\partial \alpha}$, per deg
C_n	yawing-moment coefficient, $\frac{\text{Yawing moment}}{qSd}$
C_p	pressure coefficient, $\frac{p_l - p}{q}$
$(C_{p,b})_{av}$	average base pressure coefficient, $\frac{(p_b)_{av} - p}{q}$
C_Y	side-force coefficient, $\frac{\text{Side force}}{qS}$
d	reference diameter, 28.04 cm
M	free-stream Mach number

p free-stream static pressure

$(p_b)_{av}$ average static pressure at model base

p_l local static pressure

q free-stream dynamic pressure

R_d Reynolds number based on d and free-stream conditions

r radius

r_b maximum base radius, 14.02 cm

S reference area, $\frac{\pi d^2}{4}$, 617.27 cm^2

α angle of attack, deg

ϕ roll angle used in identifying orifice location on lander base cover, positive clockwise from rear of model, deg (see fig. 4)

ϕ_m roll angle for lander plus base cover, positive clockwise from rear of model, deg (fig. 2)

APPARATUS AND TESTS

Tunnel

The investigation was conducted in the Langley 8-foot transonic pressure tunnel. This facility is a single-return, rectangular-test-section, slotted-throat tunnel capable of continuous operations through a Mach number range from about 0.20 to 1.30 with negligible effects of choking and blockage. The total pressure of the tunnel air can be varied from a minimum of about 0.25 atmosphere (1 atm = 101.3 kN/m^2) at all test Mach numbers to a maximum value of about 1.5 atmospheres at transonic Mach numbers and about 2.0 atmospheres at Mach numbers of 0.40 and less. The tunnel air is dried sufficiently to avoid any condensation effects.

Models

The models used in this investigation were 0.08-scale models of the proposed Viking configurations. The models, which consisted of the entry vehicle, the aeroshell,

and the lander plus base cover, were constructed of aluminum. The models were all supported in the tunnel by a sting, and a balance adapter constructed of steel was used to adapt the models to the balance and sting. Balance shields, as shown in figure 1, were employed to protect the balance from the airstream.

The entry vehicle (fig. 2) consists of a spherically nosed, 140° included angle, conically shaped forebody mounted base to base with an afterbody composed of two truncated cones having included angles of 80° and 124.36°. The juncture of the forebody and the afterbody (base cover) occurs at the maximum body diameter. The model with the base cover removed is defined as the aeroshell. The aeroshell was tested both with and without the deorbit-attitude control-system fuel tanks. (See fig. 2.) The lander configuration is housed inside the aeroshell and base cover. Details and identification of the components of the lander plus base cover are shown in figure 3.

The pressure model of the lander plus base cover is shown in detail in figure 4. This model was instrumented with pressure orifices on both the windward face of the lander body and terminal-descent landing radar and on the leeward and windward faces of the base cover. A dummy balance was used for the pressure tests with the identical sting support system as for the force tests. Photographs of the entry vehicle and the lander plus base cover are shown as figure 5.

Instrumentation

Aerodynamic forces and moments were measured with a six-component internal-strain-gage balance. Two strain-gage-type pressure transducers were used to measure the base pressure of the force models. Figure 1 shows the approximate location of a typical base pressure tube.

The surface pressures on the lander plus base cover were measured by employing automatic scanning units which incorporated strain-gage-type pressure transducers. Data were obtained by a high-speed data-acquisition system and recorded on magnetic tape.

Tests

The tests were conducted in the Langley 8-foot transonic pressure tunnel at Mach numbers from 0.40 to 1.20 and over an angle-of-attack range from about -1° to 24°. Test Reynolds number, based on model reference diameter and free-stream conditions, varied from 0.74×10^{6} to 1.84×10^{6} for the entry vehicle; however, all the basic force data were obtained at $R_d = 1.84 \times 10^{6}$ and the pressure data on the lander model at $R_d = 1.38 \times 10^{6}$. The total temperature was held constant at approximately 322 K to prevent condensation. The lander plus base cover was tested at roll angles ϕ_m of 0°, -60°, -120°, and -180°.

To obtain these roll angles, the balance remained upright and the model was rolled on the balance adapter. All models were tested with natural transition.

Corrections

Angles of attack have been corrected for the deflection of the balance and sting support under aerodynamic load for the force tests. No angle-of-attack corrections were applied to the pressure data; therefore, the angles shown should be considered nominal angles of attack. The maximum deviation of the nominal from the true angle of attack has been estimated to be about $\pm 0.15^\circ$. Axial-force data are presented as total balance measured axial-force coefficient; that is, no adjustments have been applied for the effects of pressure on the model base.

Accuracy

The estimated accuracies of the data for $R_d = 1.84 \times 10^6$, based on instrument calibration and data repeatability, are within the following limits:

	M = 0.40	M = 1.20
C_N	±0.004	±0.002
C_A	±0.02	±0.01
C_m	±0.0007	±0.0003
C_l	±0.0002	±0.0001
C_n	±0.0007	±0.0003
C_Y	±0.004	±0.002
C_p	±0.02	±0.01
M	±0.003	±0.010
α, deg	±0.10	±0.10

PRESENTATION OF RESULTS

The results of this investigation are presented in the following tables and figures:

DISCUSSION

Force Tests

The basic longitudinal aerodynamic data for the entry vehicle presented in figure 7 and summarized in figure 12 indicate that the entry vehicle is statically stable for all of the Mach numbers and angles of attack tested. For angles of attack from below about 4° down to the maximum negative test angle of attack and for Mach numbers less than about $M = 0.90$, C_{N_α} was essentially zero; however, for Mach numbers greater than $M = 0.90$, C_{N_α} became negative below $\alpha = 2^{\circ}$. Similar effects were reported in reference 1 on the Apollo entry model and are attributed to the flow around the shoulder (forebody and base-cover juncture) and base region. Flow separation over a large base, such as for the Viking model, is most likely unsteady. Figure 7 shows that for the available test range of Reynolds number, no changes in longitudinal characteristics were measured.

Removing the base cover from the entry vehicle to form the aeroshell eliminated the nonlinear variation of C_N with α so that C_{N_α} not only remained positive but was essentially constant, as shown in figures 8 and 12. Positive static stability is indicated for all Mach numbers and angles of attack tested. The results also indicate that the deorbit-attitude control-system fuel tanks had no measurable effect on the longitudinal aerodynamic characteristics of the aeroshell. (See fig. 8.)

The static aerodynamic characteristics of the lander plus base cover are shown in figures 9 and 10 for model roll angles ϕ_m of 0°, -60°, -120°, and -180°. This configuration is statically stable for the Mach numbers and angles of attack tested. Figure 9(a), at $\phi_m = 0^{\circ}$, indicates negative values of C_{N_α} for all Mach numbers at all negative angles of attack; C_{N_α} is also negative at positive angles of attack up to about 10° for $M = 0.40$ but to only about $\alpha = 2^{\circ}$ for $M = 1.20$. Above these positive angles of attack, C_{N_α} is shown to be essentially zero at the lower test Mach numbers and to increase to only small positive values as the Mach number increases. In the same angle-of-attack range for which C_{N_α} becomes zero or negative C_{m_α} progressively increases

up to $M = 1.20$. The variation of forces and moments that result from rolling the model, as indicated in figures 9 and 10, do not exhibit any specific trends with respect to roll angle and are associated with the lack of aerodynamic symmetry.

The variation of C_A with Mach number at $\alpha = 0^\circ$ as shown in figure 12 follows the usual trend for the Mach number range of this investigation; that is, C_A increases with Mach number and a maximum occurs near $M = 1.03$. Figure 12 also indicates that, of the configurations tested, the lander plus base cover has the largest value of C_A at all test Mach numbers for $\alpha = 0^\circ$.

Pressure Tests

Pressure distributions obtained on the lander plus base cover are presented in tables I and II. Sample distributions on the windward face of the base cover for the row of orifices located at $\phi = 0^\circ$ are shown in figure 11(a) for model roll angles ϕ_m of 0°, -60°, -120°, and -180°. Similar results for the leeward face of the base cover at $\phi = 180^\circ$ are shown in figure 11(b), and for the lander body and terminal-descent landing radar at $\phi_m = 0^\circ$ in figure 11(c). These data were obtained for design purposes of the lander configuration and no discussion is included.

CONCLUDING REMARKS

A wind-tunnel investigation has been conducted to determine the subsonic and transonic aerodynamic characteristics of the proposed Viking entry and lander configurations. The investigation was conducted at Mach numbers from 0.40 to 1.20 for an angle-of-attack range from about -1° to 24°. The results of the investigation are summarized as follows:

1. All configurations are statically stable throughout the Mach number and angle-of-attack range tested; however, some nonlinearities are indicated.

2. Removing the base cover from the entry vehicle to form the aeroshell eliminates the nonlinear variation of normal-force coefficient with angle of attack and results in positive normal-force-curve slopes at all Mach numbers and angles of attack.

3. Both the entry vehicle and the lander plus base cover exhibit nonlinear variations of normal-force-curve slope at low angles of attack, and both positive and negative slopes occur dependent upon Mach number and angle of attack.

4. The lander plus base cover which is axially unsymmetrical shows only minor variations in the basic stability parameters as a function of roll orientation.

Langley Research Center,
National Aeronautics and Space Administration,
Hampton, Va., August 12, 1971.

REFERENCE

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TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN

(a) M = 0.4; $\alpha = 0^{o}$ and 4^{o}

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{o}$	$\phi = 30^{o}$	$\phi = 90^{o}$	$\phi = 120^{o}$	$\phi = 180^{o}$	$\phi = 210^{o}$	$\phi = 240^{o}$	$\phi = 270^{o}$		$\phi = 150^{o}$	$\phi = 180^{o}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 0^{o}$; $\phi_m = 0^{o}$													
.385	.901	.902	.907	.874		.882		.880	.385	-.414	-.418	51	1.043
.550	.828	.854	.866	.843	.858	.861	.887	.854	.550	-.401	-.410	52	1.047
.696	.877	.808	.798	.870	.837	.837	.816	.875	.696	-.402	-.405	53	1.037
.767	.999	.899	.894	1.016	.835	.859	.921	.901	.767	-.402	-.404	64	1.011
.850	1.032	.939	.945	.993	.826	.850	.885	.933	.850	-.377	-.391	65*	.996
.932	.983	1.006	1.023	1.026	.723	1.003	1.002	1.026	.932	-.376	-.387	65*	.983
$\alpha = 0^{o}$; $\phi_m = -60^{o}$													
.385	.915	.905	.880	.881		.880		.874	.385	-.407	-.404	61	1.044
.550	.837	.874	.866	.851	.861	.857	.888	.862	.550	-.399	-.400	52	1.048
.696	.879	.828	.787	.870	.839	.834	.816	.885	.696	-.395	-.402	53	1.034
.767	.992	.890	.893	1.025	.846	.871	.924	.903	.767	-.401	-.396	64	.995
.850	1.000	.943	.944	.997	.825	.875	.891	.944	.850	-.389	-.379	55*	1.019
.932	.995	1.007	1.023	1.019	.715	1.019	1.006	1.019	.932	-.374	-.366	66*	.980
$\alpha = 0^{o}$; $\phi_m = -180^{o}$													
.385	.908	.896	.906	.881		.883		.875	.385	-.419	-.414	51	1.041
.550	.830	.851	.867	.850	.865	.857	.893	.852	.550	-.407	-.409	62	1.047
.696	.872	.817	.795	.877	.841	.831	.822	.878	.696	-.396	-.397	53	1.033
.767	1.002	.895	.891	1.025	.843	.860	.924	.900	.767	-.406	-.391	54	.985
.850	1.039	.951	.944	1.001	.827	.864	.892	.936	.850	-.395	-.389	65*	.999
.932	.992	1.009	1.021	1.015	.726	1.012	1.010	1.015	.932	-.391	-.375	55*	.984
$\alpha = 4^{o}$; $\phi_m = 0^{o}$													
.385	.851	.851	.855	.882		.879		.865	.385	-.422	-.429	51	1.044
.550	.852	.850	.842	.866	.884	.869	.885	.847	.550	-.416	-.415	52	1.053
.696	.847	.863	.888	.892	.872	.803	.851	.850	.696	-.419	-.409	53	1.051
.767	.879	.844	.906	1.047	.851	.903	.913	.904	.767	-.419	-.412	64	1.028
.850	.885	.831	.977	.996	.819	.925	.881	.971	.850	-.412	-.395	55*	1.025
.932	.891	.865	1.007	.999	.748	1.033	1.013	.999	.932	-.393	-.390	56*	1.001
$\alpha = 4^{o}$; $\phi_m = -60^{o}$													
.385	.862	.850	.855	.877		.855		.858	.385	-.418	-.429	51	1.043
.550	.875	.853	.848	.902	.815	.863	.897	.858	.550	-.404	-.412	52	1.046
.696	.870	.839	.867	.931	.799	.881	.902	.880	.696	-.404	-.410	53	1.037
.767	.918	.844	.830	1.016	.823	.969	.934	.940	.767	-.402	-.404	54	1.004
.850	.935	.823	.818	1.000	.811	1.015	.888	.999	.850	-.402	-.398	55*	1.013
.932	.995	.951	.885	1.009	.775	1.019	1.015	1.009	.932	-.389	-.380	66*	.980
$\alpha = 4^{o}$; $\phi_m = -120^{o}$													
.385	.919	.900	.897	.896		.901		.897	.385	-.385	-.406	51	1.047
.550	.842	.852	.859	.889	.876	.884	.907	.891	.550	-.377	-.400	62	1.056
.696	.951	.874	.878	.918	.806	.908	.870	.918	.696	-.392	-.396	63	1.045
.767	1.021	.934	.857	.929	.813	.920	.942	.944	.767	-.383	-.400	54	1.022
.850	1.044	.992	.867	.965	.758	.984	.914	.998	.850	-.388	-.375	65*	1.018
.932	.994	1.004	.915	1.024	.726	1.020	1.010	1.024	.932	-.361	-.381	56*	.976
$\alpha = 4^{o}$; $\phi_m = -180^{o}$													
.385	.919	.907	.898	.871		.880		.888	.385	-.391	-.391	51	1.045
.550	.848	.857	.892	.850	.861	.847	.883	.865	.550	-.387	-.380	52	1.052
.696	.968	.897	.873	.850	.829	.832	.795	.852	.696	-.389	-.374	53	1.043
.767	1.019	.959	.898	.973	.820	.828	.919	.879	.767	-.389	-.381	54	1.006
.850	1.040	1.005	.850	.997	.818	.831	.883	.893	.850	-.381	-.367	55*	.981
.932	.998	1.005	1.022	1.027	.699	.972	1.003	1.027	.932	-.364	-.360	66*	.968

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(a) M = 0.4; $\alpha = 6^{o}$ and 9^{o} - Continued

r/r_b	C_p for - Windward face, $\phi = 0^{o}$	$\phi = 30^{o}$	$\phi = 90^{o}$	$\phi = 120^{o}$	$\phi = 180^{o}$	$\phi = 210^{o}$	$\phi = 240^{o}$	$\phi = 270^{o}$	r/r_b	C_p for - Leeward face, $\phi = 150^{o}$	$\phi = 180^{o}$	Orifice	C_p for - Terminal descent landing radar
					$\alpha = 6^{o}$; $\phi_m = 0^{o}$								
.385	.841	.849	.856	.884		.887		.857	.385	-.443	-.434	61	1.040
.550	.847	.840	.838	.864	.896	.883	.878	.857	.550	-.435	-.436	62	1.049
.696	.852	.857	.893	.888	.875	.806	.863	.841	.696	-.429	-.427	63	1.046
.767	.850	.825	.904	1.045	.863	.925	.918	.911	.767	-.433	-.427	64	1.032
.850	.860	.847	.976	.995	.829	.953	.889	.975	.850	-.429	-.421	65*	1.029
.932	.803	.810	1.002	.993	.770	1.028	1.016	.993	.932	-.416	-.411	66*	1.010
					$\alpha = 6^{o}$; $\phi_m = -60^{o}$								
.385	.863	.855	.860	.886		.884		.867	.385	-.420	-.447	61	1.040
.550	.865	.858	.853	.908	.812	.881	.909	.874	.550	-.415	-.434	62	1.047
.696	.859	.860	.857	.944	.797	.924	.915	.895	.696	-.417	-.472	63	1.042
.767	.907	.841	.822	.948	.814	.997	.947	.955	.767	-.421	-.419	64	1.010
.850	.923	.780	.800	1.004	.796	1.025	.908	1.007	.850	-.415	-.405	65*	1.019
.932	.988	.935	.833	1.015	.802	1.025	1.021	1.015	.932	-.401	-.393	66*	.985
					$\alpha = 6^{o}$; $\phi_m = -120^{o}$								
.385	.917	.901	.902	.899		.901		.912	.385	-.389	-.409	61	1.046
.550	.846	.855	.853	.884	.868	.892	.904	.904	.550	-.389	-.404	62	1.053
.696	.939	.909	.865	.918	.781	.926	.890	.888	.696	-.396	-.404	63	1.054
.767	1.014	.951	.834	.896	.789	.941	.942	.944	.767	-.402	-.406	64	1.035
.850	1.036	.997	.854	.933	.727	.999	.914	.970	.850	-.396	-.392	65*	1.016
.932	.992	.987	.847	.997	.695	1.017	1.007	.997	.932	-.375	-.373	66*	.973
					$\alpha = 6^{o}$; $\phi_m = -180^{o}$								
.385	.932	.917	.895	.860		.876		.890	.385	-.397	-.377	61	1.040
.550	.850	.862	.869	.856	.846	.845	.873	.868	.550	-.387	-.374	62	1.053
.696	.981	.923	.881	.849	.823	.824	.794	.852	.696	-.386	-.380	63	1.050
.767	1.028	.973	.886	.939	.811	.819	.908	.874	.767	-.387	-.386	64	1.017
.850	1.041	1.011	.829	.993	.805	.817	.882	.852	.850	-.375	-.376	65*	.966
.932	1.005	1.005	.963	.984	.679	.921	.999	.984	.932	-.352	-.368	66*	.948
					$\alpha = 9^{o}$; $\phi_m = 0^{o}$								
.385	.819	.831	.848	.896		.901		.853	.385	-.468	-.461	61	1.030
.550	.828	.828	.821	.888	.898	.888	.884	.857	.550	-.452	-.454	62	1.045
.696	.839	.843	.889	.872	.891	.851	.875	.854	.696	-.443	-.447	63	1.045
.767	.832	.807	.896	1.037	.888	.950	.916	.908	.767	-.443	-.440	64	1.039
.850	.841	.819	.966	.996	.851	.967	.890	.967	.850	-.459	-.434	65*	1.030
.932	.755	.754	.984	.980	.840	1.028	1.010	.980	.932	-.447	-.421	66*	1.019
					$\alpha = 9^{o}$; $\phi_m = -60^{o}$								
.385	.856	.853	.859	.888		.908		.875	.385	-.457	-.478	61	1.036
.550	.857	.844	.847	.913	.813	.906	.930	.890	.550	-.446	-.464	62	1.050
.696	.813	.824	.857	.925	.789	.952	.939	.901	.696	-.455	-.452	63	1.054
.767	.901	.820	.809	.917	.823	1.008	.962	.964	.767	-.454	-.443	64	1.027
.850	.935	.773	.801	.985	.815	1.028	.927	1.004	.850	-.449	-.428	65*	1.020
.932	.984	.910	.779	1.006	.859	1.021	1.019	1.006	.932	-.424	-.416	66*	.990
					$\alpha = 9^{o}$; $\phi_m = -120^{o}$								
.385	.930	.904	.896	.887		.904		.922	.385	-.400	-.428	61	1.036
.550	.855	.876	.840	.886	.863	.897	.912	.911	.550	-.386	-.420	62	1.054
.696	.983	.937	.859	.919	.752	.948	.890	.888	.696	-.402	-.413	63	1.055
.767	1.024	.952	.796	.874	.769	.961	.936	.973	.767	-.397	-.421	64	1.039
.850	1.035	.991	.821	.899	.715	1.011	.915	.979	.850	-.413	-.400	65*	1.010
.932	.991	.977	.789	.927	.643	1.013	.999	.927	.932	-.389	-.385	66*	.962
					$\alpha = 9^{o}$; $\phi_m = -180^{o}$								
.385	.951	.935	.882	.841		.861		.876	.385	-.419	-.394	61	1.036
.550	.893	.888	.851	.859	.829	.840	.880	.861	.550	-.402	-.372	62	1.054
.696	.989	.963	.875	.849	.812	.828	.862	.862	.696	-.397	-.374	63	1.056
.767	1.027	.993	.887	.917	.800	.798	.910	.882	.767	-.398	-.386	64	1.032
.850	1.042	1.019	.852	.986	.797	.811	.891	.843	.850	-.383	-.365	65*	.950
.932	1.009	1.006	.829	.907	.655	.832	.997	.907	.932	-.357	-.359	66*	.928

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(a) $M = 0.4$; $\alpha = 16^{\circ}$ and 24° - Concluded

r/r_b	C_p for - Windward face, $\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$	r/r_b	C_p for - Leeward face, $\phi = 150^{\circ}$	$\phi = 180^{\circ}$	Orifice	C_p for - Terminal descent landing radar
$\alpha = 16^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.756	.756	.822	.914		.960		.829	.385	-.527	-.515	61	1.003
.550	.782	.778	.799	.906	.925	.912	.902	.861	.550	-.513	-.509	62	1.031
.696	.800	.790	.856	.908	.919	.943	.914	.795	.696	-.504	-.498	63	1.040
.767	.782	.752	.861	1.033	.980	1.014	.957	.857	.767	-.493	-.498	64	1.049
.850	.730	.756	.930	.987	.969	1.024	.910	.923	.850	-.504	-.485	55*	1.042
.932	.639	.676	.941	.939	.884	1.021	1.011	.939	.932	-.489	-.472	55*	1.035
$\alpha = 16^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.829	.820	.843	.888		.952		.983	.385	-.526	-.534	61	1.010
.550	.833	.814	.819	.906	.834	.941	.942	.920	.550	-.517	-.519	52	1.033
.696	.809	.827	.820	.890	.809	1.004	.941	.915	.696	-.522	-.497	53	1.047
.767	.807	.740	.765	.803	.884	1.028	.982	.962	.767	-.530	-.490	64	1.050
.850	.771	.746	.749	.860	.914	1.035	.947	.998	.850	-.541	-.476	55*	1.006
.932	.900	.665	.709	1.013	.881	1.027	1.034	1.013	.932	-.516	-.456	66*	.982
$\alpha = 16^{\circ}$; $\phi_m = -120^{\circ}$													
.385	.956	.918	.920	.900		.869		.904	.385	-.441	-.491	51	1.005
.550	.914	.895	.829	.890	.824	.875	.907	.914	.550	-.431	-.457	52	1.036
.696	.929	.906	.857	.908	.694	.978	.894	.887	.696	-.428	-.457	53	1.047
.767	1.010	.950	.646	.832	.731	.985	.912	.975	.767	-.423	-.456	54	1.056
.850	1.026	.576	.726	.844	.685	1.013	.904	.995	.850	-.430	-.436	65*	.972
.932	.988	.935	.673	1.029	.487	.979	.978	1.029	.932	-.441	-.428	55*	.921
$\alpha = 16^{\circ}$; $\phi_m = -180^{\circ}$													
.385	.983	.971	.864	.796		.839		.865	.385	-.472	-.430	61	1.005
.550	.965	.949	.798	.814	.791	.799	.853	.836	.550	-.458	-.435	62	1.035
.696	1.005	1.004	.797	.915	.762	.797	.877	.860	.696	-.442	-.425	63	1.046
.767	1.036	1.007	.787	.882	.764	.757	.893	.853	.767	-.440	-.416	64	1.047
.850	1.042	1.016	.807	.946	.743	.757	.890	.875	.850	-.422	-.407	55*	.885
.932	1.029	1.008	.790	.866	.585	.685	.951	.866	.932	-.398	-.391	66*	.861
$\alpha = 24^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.675	.649	.802	.909		.977		.798	.385	-.568	-.563	61	.940
.550	.698	.692	.794	.912	.943	.936	.927	.795	.550	-.560	-.552	52	.981
.696	.719	.740	.785	.898	.935	.987	.919	.788	.696	-.548	-.547	53	1.012
.767	.699	.646	.798	1.011	1.006	1.014	.939	.769	.767	-.555	-.549	54	1.034
.850	.700	.672	.860	.979	.998	1.006	.925	.958	.850	-.544	-.535	55*	1.045
.932	.571	.545	.875	.878	.937	1.017	.988	.878	.932	-.538	-.530	55*	1.046
$\alpha = 24^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.796	.775	.812	.862		.934		.876	.385	-.581	-.588	51	.947
.550	.806	.767	.770	.883	.810	.933	.951	.909	.550	-.571	-.572	62	.998
.696	.775	.783	.775	.868	.787	.995	.923	.904	.696	-.589	-.544	63	1.022
.767	.777	.677	.696	.750	.870	1.022	.968	.942	.767	-.605	-.548	54	1.052
.850	.687	.655	.683	.607	.912	1.030	.939	.969	.850	-.637	-.515	55*	.981
.932	.852	.542	.620	1.009	.867	1.030	1.046	1.009	.932	-.609	-.510	66*	.959
$\alpha = 24^{\circ}$; $\phi_m = -120^{\circ}$													
.385	.931	.895	.877	.864		.804		.902	.385	-.502	-.555	61	.958
.550	.922	.892	.770	.857	.773	.891	.884	.920	.550	-.496	-.549	52	.989
.696	.955	.900	.811	.875	.611	.898	.837	.886	.696	-.483	-.524	53	1.022
.767	.992	.925	.499	.734	.650	.979	.875	.984	.767	-.470	-.520	54	1.040
.850	1.032	.939	.644	.791	.661	.990	.873	1.010	.850	-.484	-.499	55*	.915
.932	.966	.881	.593	1.031	.577	.939	.949	1.031	.932	-.527	-.479	55*	.867
$\alpha = 24^{\circ}$; $\phi_m = -180^{\circ}$													
.385	.979	.967	.836	.750		.796		.841	.385	-.527	-.489	61	.945
.550	.986	.971	.764	.767	.737	.752	.790	.820	.550	-.509	-.485	62	.985
.696	1.013	1.006	.732	.858	.708	.744	.786	.814	.696	-.505	-.468	53	1.018
.767	1.032	1.017	.727	.778	.701	.712	.787	.784	.767	-.491	-.460	54	1.046
.850	1.037	1.013	.789	.843	.688	.709	.830	.809	.850	-.458	-.431	55*	.798
.932	1.045	1.006	.878	.879	.508	.610	.837	.879	.932	-.439	-.412	56*	.783

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(b) $M = 0.6$; $\alpha = 0^{\circ}$ and 4°

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 0^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.957	.953	.968	.934		.936		.936	.385	-.391	-.394	61	1.096
.550	.883	.907	.917	.901	.919	.914	.946	.911	.550	-.390	-.390	62	1.102
.696	.923	.854	.852	.927	.896	.891	.877	.927	.696	-.389	-.385	63	1.088
.767	1.052	.953	.947	1.071	.895	.917	.978	.957	.767	-.393	-.388	54	1.063
.850	1.085	1.003	.991	1.049	.886	.908	.943	.986	.850	-.386	-.379	55*	1.047
.932	1.038	1.061	1.076	1.074	.789	1.060	1.061	1.074	.932	-.370	-.371	66*	1.036
$\alpha = 0^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.959	.959	.962	.932		.935		.934	.385	-.403	-.403	61	1.099
.550	.904	.930	.923	.913	.916	.915	.946	.916	.550	-.390	-.393	62	1.102
.696	.922	.854	.850	.934	.898	.886	.879	.941	.696	-.390	-.393	63	1.089
.767	1.036	.957	.946	1.078	.897	.918	.982	.952	.767	-.390	-.391	64	1.052
.850	1.082	1.005	.994	1.055	.877	.917	.946	.981	.850	-.383	-.379	55*	1.074
.932	1.041	1.056	1.077	1.074	.779	1.052	1.065	1.074	.932	-.362	-.372	56*	1.039
$\alpha = 0^{\circ}$; $\phi_m = -120^{\circ}$													
.385	.957	.951	.944	.925		.936		.942	.385	-.403	-.398	61	1.100
.550	.902	.934	.912	.903	.913	.915	.936	.919	.550	-.391	-.390	62	1.103
.696	.914	.873	.840	.931	.894	.891	.873	.936	.696	-.394	-.391	63	1.090
.767	1.027	.952	.947	1.071	.894	.922	.972	.955	.767	-.396	-.392	54	1.058
.850	1.068	.979	.993	1.046	.877	.917	.936	.987	.850	-.393	-.384	65*	1.073
.932	1.042	1.052	1.080	1.078	.781	1.054	1.061	1.078	.932	-.374	-.374	66*	1.030
$\alpha = 0^{\circ}$; $\phi_m = -180^{\circ}$													
.385	.963	.956	.964	.935		.944		.939	.385	-.406	-.403	61	1.093
.550	.891	.915	.922	.908	.923	.921	.945	.919	.550	-.394	-.394	52	1.101
.696	.923	.866	.851	.931	.902	.896	.878	.940	.696	-.392	-.390	53	1.084
.767	1.055	.958	.951	1.072	.904	.929	.980	.961	.767	-.392	-.395	54	1.038
.850	1.092	1.009	.997	1.054	.893	.928	.947	.993	.850	-.385	-.380	65*	1.052
.932	1.048	1.064	1.078	1.078	.795	1.072	1.063	1.078	.932	-.369	-.374	55*	1.039
$\alpha = 4^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.913	.909	.906	.928		.929		.913	.385	-.426	-.423	61	1.091
.550	.911	.904	.891	.914	.940	.919	.939	.902	.550	-.417	-.415	52	1.101
.696	.906	.921	.936	.943	.926	.857	.903	.911	.696	-.412	-.410	53	1.093
.767	.932	.900	.955	1.099	.915	.954	.969	.953	.767	-.411	-.407	64	1.075
.850	.934	.895	1.026	1.048	.876	.978	.941	1.017	.850	-.412	-.401	55*	1.073
.932	.947	.913	1.061	1.053	.793	1.082	1.066	1.053	.932	-.400	-.392	56*	1.048
$\alpha = 4^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.913	.904	.913	.931		.910		.911	.385	-.406	-.418	61	1.094
.550	.925	.905	.908	.953	.872	.915	.954	.914	.550	-.397	-.404	62	1.102
.696	.918	.896	.918	.981	.859	.936	.960	.931	.696	-.402	-.398	53	1.093
.767	.967	.898	.886	1.058	.881	1.019	.990	.994	.767	-.408	-.402	54	1.057
.850	.989	.876	.875	1.054	.877	1.063	.949	1.053	.850	-.401	-.392	55*	1.072
.932	1.047	.997	.938	1.063	.840	1.070	1.073	1.063	.932	-.378	-.383	55*	1.037
$\alpha = 4^{\circ}$; $\phi_m = -180^{\circ}$													
.385	.968	.952	.952	.946		.954		.955	.385	-.383	-.399	51	1.097
.550	.891	.904	.913	.940	.932	.938	.951	.946	.550	-.373	-.384	52	1.106
.696	1.001	.924	.932	.971	.866	.961	.930	.977	.696	-.378	-.382	53	1.100
.767	1.072	.987	.917	.973	.862	.980	.997	.996	.767	-.380	-.386	54	1.074
.850	1.092	1.046	.922	1.014	.811	1.041	.962	1.052	.850	-.386	-.372	55*	1.067
.932	1.048	1.050	.976	1.078	.781	1.073	1.060	1.078	.932	-.359	-.362	65*	1.030

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(b) M = 0.6; $\alpha = 6^{\circ}$ and 9° - Continued

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 6^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.896	.899	.915	.936		.939		.910	.385	-.436	-.436	61	1.088
.550	.904	.897	.892	.913	.955	.937	.935	.913	.550	-.429	-.425	62	1.105
.696	.909	.909	.951	.944	.936	.863	.920	.901	.696	-.427	-.418	53	1.103
.767	.909	.876	.963	1.099	.923	.976	.972	.966	.767	-.423	-.418	54	1.088
.850	.915	.901	1.033	1.050	.886	1.009	.941	1.032	.850	-.425	-.412	65*	1.086
.932	.860	.863	1.053	1.053	.832	1.082	1.068	1.053	.932	-.412	-.404	55*	1.061
$\alpha = 6^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.917	.911	.917	.935		.944		.928	.385	-.423	-.445	51	1.092
.550	.921	.913	.911	.963	.867	.943	.963	.932	.550	-.409	-.432	52	1.104
.696	.917	.913	.917	.988	.853	.982	.966	.954	.696	-.418	-.423	53	1.097
.767	.955	.895	.886	.993	.868	1.051	.990	1.015	.767	-.423	-.425	54	1.066
.850	.969	.831	.865	1.051	.853	1.084	.954	1.060	.850	-.423	-.402	55*	1.070
.932	1.039	.978	.894	1.067	.857	1.075	1.069	1.067	.932	-.398	-.391	56*	1.036
$\alpha = 6^{\circ}$; $\phi_m = -120^{\circ}$													
.385	.974	.955	.951	.951		.952		.959	.385	-.392	-.415	51	1.091
.550	.908	.909	.907	.944	.925	.944	.958	.951	.550	-.387	-.405	52	1.103
.696	.994	.953	.919	.983	.845	.977	.942	.947	.696	-.390	-.400	63	1.100
.767	1.078	1.003	.888	.956	.844	.991	.993	.997	.767	-.395	-.404	54	1.082
.850	1.096	1.053	.906	.991	.791	1.049	.965.	1.019	.850	-.398	-.388	65*	1.063
.932	1.049	1.041	.900	1.051	.757	1.070	1.058	1.051	.932	-.376	-.373	56*	1.022
$\alpha = 6^{\circ}$; $\phi_m = -180^{\circ}$													
.385	.989	.973	.949	.915		.928		.944	.385	-.386	-.381	61	1.093
.550	.923	.922	.924	.918	.904	.900	.933	.927	.550	-.378	-.372	52	1.105
.696	1.039	.979	.938	.909	.882	.884	.862	.909	.696	-.378	-.370	63	1.100
.767	1.083	1.031	.939	.995	.873	.878	.966	.933	.767	-.377	-.375	54	1.071
.850	1.095	1.067	.882	1.047	.869	.878	.942	.904	.850	-.370	-.364	55*	1.019
.932	1.059	1.059	1.006	1.029	.742	.969	1.055	1.029	.932	-.350	-.353	66*	1.003
$\alpha = 9^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.876	.882	.904	.956		.959		.905	.385	-.463	-.459	51	1.080
.550	.882	.881	.881	.944	.957	.943	.940	.913	.550	-.447	-.450	62	1.100
.696	.897	.902	.945	.930	.956	.905	.937	.911	.696	-.442	-.440	53	1.101
.767	.894	.961	.948	1.090	.949	1.003	.976	.961	.767	-.444	-.'437	54	1.092
.850	.893	.872	1.018	1.052	.913	1.021	.950	1.025	.850	-.455	-.428	55*	1.094
.932	.812	.810	1.037	1.033	.902	1.077	1.068	1.033	.932	-.442	-.420	55*	1.074
$\alpha = 9^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.915	.904	.913	.943		.966		.929	.385	-.457	-.478	61	1.085
.550	.916	.902	.901	.969	.874	.963	.989	.947	.550	-.447	-.460	52	1.102
.696	.873	.892	.908	.973	.849	1.008	.993	.960	.696	-.450	-.450	53	1.105
.767	.952	.881	.863	.966	.888	1.064	1.018	1.019	.767	-.455	-.445	54	1.080
.850	.979	.830	.857	1.036	.871	1.085	.982	1.059	.850	-.461	-.427	55*	1.073
.932	1.037	.948	.835	1.064	.918	1.073	1.077	1.064	.932	-.439	-.412	56*	1.042
$\alpha = 9^{\circ}$; $\phi_m = -120^{\circ}$													
.385	.935	.957	.950	.945		.958		.978	.385	-.402	-.435	51	1.088
.550	.912	.929	.898	.941	.924	.950	.966	.968	.550	-.397	-.419	52	1.104
.696	1.035	.992	.916	.973	.814	.998	.948	.943	.696	-.396	-.410	63	1.106
.767	1.072	1.007	.850	.929	.827	1.012	.990	1.023	.767	-.402	-.414	54	1.090
.850	1.093	1.051	.872	.951	.773	1.059	.967	1.028	.850	-.405	-.402	55*	1.064
.932	1.046	1.029	.842	.991	.704	1.060	1.053	.991	.932	-.385	-.392	66*	1.015
$\alpha = 9^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.006	.989	.939	.896		.915		.935	.385	-.405	-.393	61	1.085
.550	.948	.943	.901	.915	.884	.892	.933	.916	.550	-.396	-.386	62	1.106
.696	1.047	1.015	.929	.911	.869	.881	.922	.923	.696	-.395	-.382	53	1.103
.767	1.083	1.044	.938	.965	.861	.855	.963	.938	.767	-.395	-.381	54	1.083
.850	1.097	1.071	.920	1.035	.854	.862	.952	.896	.850	-.391	-.367	65*	.998
.932	1.066	1.055	.882	.956	.715	.881	1.051	.956	.932	-.362	-.360	56*	.981

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(b) M = 0.6; $\alpha = 16^{\circ}$ and 24° - Concluded

r/r_b	C_p for - Windward face, $\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$	r/r_b	C_p for - Leeward face, $\phi = 150^{\circ}$	$\phi = 180^{\circ}$	Orifice	C_p for - Terminal descent landing radar
$\alpha = 16^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.816	.813	.878	.968		1.010		.887	.385	-.512	-.499	51	1.052
.550	.840	.831	.862	.966	.978	.968	.954	.912	.550	-.503	-.499	62	1.081
.696	.859	.851	.914	.966	.976	.993	.965	.852	.696	-.496	-.488	53	1.094
.767	.838	.801	.918	1.085	1.038	1.067	1.006	.914	.767	-.492	-.486	54	1.103
.850	.838	.810	.985	1.042	1.028	1.077	.968	.978	.850	-.493	-.481	55*	1.102
.932	.700	.736	.996	.993	.938	1.073	1.064	.993	.932	-.478	-.472	66*	1.091
$\alpha = 16^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.879	.868	.896	.936		1.001		.939	.385	-.525	-.529	51	1.056
.550	.885	.867	.875	.960	.889	.991	.999	.974	.550	-.510	-.516	52	1.089
.696	.858	.879	.877	.940	.860	1.053	.991	.973	.696	-.514	-.498	53	1.101
.767	.858	.793	.810	.857	.935	1.077	1.029	1.016	.767	-.524	-.494	64	1.102
.850	.824	.802	.805	.905	.968	1.086	1.001	1.048	.850	-.535	-.474	55*	1.061
.932	.941	.717	.767	1.067	.931	1.082	1.087	1.067	.932	-.498	-.460	56*	1.037
$\alpha = 16^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.005	.974	.975	.953		.917		.958	.385	-.443	-.482	51	1.056
.550	.962	.948	.877	.943	.883	.926	.967	.969	.550	-.437	-.470	62	1.086
.696	.980	.961	.911	.961	.753	1.033	.951	.938	.696	-.425	-.450	53	1.101
.767	1.061	1.005	.695	.882	.787	1.039	.976	1.026	.767	-.424	-.448	64	1.104
.850	1.075	1.033	.775	.891	.737	1.061	.960	1.048	.850	-.436	-.439	65*	1.024
.932	1.034	.992	.730	1.084	.551	1.026	1.035	1.084	.932	-.427	-.426	56*	.975
$\alpha = 16^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.037	1.031	.925	.849		.896		.924	.385	-.473	-.441	61	1.055
.550	1.016	1.007	.855	.862	.849	.861	.906	.891	.550	-.462	-.438	62	1.086
.696	1.059	1.059	.857	.973	.817	.853	.930	.915	.696	-.454	-.426	63	1.102
.767	1.088	1.061	.834	.933	.815	.819	.939	.905	.767	-.448	-.422	64	1.103
.850	1.094	1.069	.861	.992	.799	.817	.945	.925	.850	-.419	-.404	55*	.942
.932	1.080	1.059	.849	.907	.640	.746	1.000	.907	.932	-.398	-.393	56*	.918
$\alpha = 24^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.730	.706	.865	.959		1.032		.856	.385	-.552	-.543	61	.992
.550	.756	.748	.855	.969	.998	.991	.981	.852	.550	-.547	-.542	62	1.034
.696	.768	.794	.844	.954	.992	1.043	.973	.845	.696	-.536	-.533	53	1.066
.767	.756	.706	.854	1.058	1.061	1.073	.993	.825	.767	-.532	-.530	54	1.090
.850	.756	.727	.913	1.029	1.053	1.070	.982	.920	.850	-.528	-.527	65*	1.102
.932	.626	.604	.932	.941	.993	1.071	1.040	.941	.932	-.513	-.525	56*	1.107
$\alpha = 24^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.846	.826	.860	.916		.987		.928	.385	-.568	-.569	61	1.000
.550	.856	.822	.820	.936	.864	.986	1.005	.960	.550	-.560	-.557	62	1.041
.696	.829	.839	.826	.922	.839	1.051	.973	.951	.696	-.571	-.539	53	1.069
.767	.831	.735	.743	.809	.919	1.073	1.016	.992	.767	-.587	-.532	64	1.100
.850	.741	.720	.734	.661	.959	1.078	.990	1.016	.850	-.615	-.512	55*	1.026
.932	.903	.594	.689	1.052	.919	1.082	1.099	1.052	.932	-.591	-.501	66*	1.006
$\alpha = 24^{\circ}$; $\phi_m = -120^{\circ}$													
.385	.982	.946	.930	.912		.860		.951	.385	-.512	-.555	51	1.004
.550	.972	.947	.827	.905	.830	.946	.936	.971	.550	-.504	-.545	52	1.043
.696	1.010	.957	.866	.927	.673	.947	.898	.938	.696	-.493	-.523	53	1.069
.767	1.046	.981	.558	.782	.708	1.034	.928	1.034	.767	-.473	-.519	54	1.092
.850	1.053	.991	.703	.846	.716	1.044	.929	1.061	.850	-.498	-.501	65*	.969
.932	1.020	.934	.654	1.084	.640	.990	1.003	1.084	.932	-.522	-.488	55*	.916
$\alpha = 24^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.031	1.020	.891	.805		.855		.892	.385	-.518	-.495	51	.994
.550	1.038	1.020	.817	.821	.795	.807	.846	.867	.550	-.514	-.494	62	1.036
.696	1.068	1.058	.785	.921	.763	.796	.843	.863	.696	-.505	-.480	53	1.071
.767	1.088	1.069	.776	.831	.756	.763	.844	.833	.767	-.496	-.464	64	1.100
.850	1.092	1.062	.839	.889	.739	.759	.880	.859	.850	-.466	-.438	55*	.852
.932	1.093	1.056	.929	.930	.566	.664	.885	.930	.932	-.439	-.423	56*	.836

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(c) M = 0.8; $\alpha = 0^o$ and 4^o

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^o$	$\phi = 30^o$	$\phi = 90^o$	$\phi = 120^o$	$\phi = 180^o$	$\phi = 210^o$	$\phi = 240^o$	$\phi = 270^o$		$\phi = 150^o$	$\phi = 180^o$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 0^o$; $\phi_m = 0^o$													
.385	1.037	1.038	1.045	1.014		1.024		1.017	.385	-.382	-.382	61	1.171
.550	.970	.996	1.006	.986	.999	1.000	1.023	.998	.550	-.375	-.374	62	1.177
.656	1.001	.938	.938	1.007	.979	.981	.957	1.014	.696	-.375	-.372	63	1.168
.767	1.129	1.034	1.029	1.146	.978	1.001	1.056	1.038	.767	-.376	-.375	64	1.140
.850	1.161	1.084	1.075	1.127	.971	.992	1.021	1.064	.850	-.369	-.364	65*	1.129
.932	1.120	1.138	1.156	1.154	.881	1.138	1.138	1.154	.932	-.351	-.353	66*	1.118
$\alpha = 0^o$; $\phi_m = -60^o$													
.385	1.042	1.036	1.043	1.011		1.021		1.017	.385	-.380	-.379	61	1.170
.550	.987	1.011	1.007	.993	1.002	1.002	1.024	1.001	.550	-.373	-.373	62	1.172
.656	1.011	.939	.933	1.010	.983	.983	.962	1.022	.696	-.373	-.359	63	1.160
.767	1.131	1.030	1.027	1.153	.983	1.003	1.058	1.035	.767	-.375	-.369	64	1.124
.850	1.166	1.074	1.074	1.129	.966	1.004	1.024	1.062	.850	-.365	-.350	65*	1.146
.932	1.123	1.133	1.155	1.156	.873	1.131	1.141	1.156	.932	-.346	-.353	66*	1.112
$\alpha = 0^o$; $\phi_m = -120^o$													
.385	1.036	1.018	1.025	1.012		1.011		1.017	.385	-.381	-.377	61	1.171
.550	.993	1.011	.998	.999	1.000	.993	1.024	.998	.550	-.373	-.372	62	1.176
.696	.994	.986	.923	1.020	.980	.958	.963	1.023	.696	-.372	-.370	63	1.166
.767	1.139	1.030	1.026	1.154	.983	1.006	1.059	1.038	.767	-.375	-.370	64	1.137
.850	1.128	1.049	1.070	1.132	.964	1.027	1.025	1.067	.850	-.369	-.359	65*	1.151
.932	1.131	1.127	1.155	1.158	.879	1.149	1.144	1.158	.932	-.351	-.353	66*	1.116
$\alpha = 0^o$; $\phi_m = -180^o$													
.385	1.040	1.039	1.042	1.015		1.023		1.018	.385	-.378	-.390	61	1.168
.550	.974	.995	1.006	.992	1.006	1.004	1.027	.999	.550	-.372	-.372	62	1.175
.696	.997	.940	.935	1.013	.984	.974	.963	1.020	.696	-.371	-.358	63	1.159
.767	1.132	1.033	1.030	1.149	.985	1.009	1.060	1.040	.767	-.372	-.368	64	1.118
.850	1.165	1.082	1.071	1.132	.974	1.006	1.026	1.068	.850	-.364	-.360	65*	1.131
.932	1.125	1.140	1.155	1.154	.880	1.145	1.143	1.154	.932	-.348	-.354	66*	1.119
$\alpha = 4^o$; $\phi_m = 0^o$													
.385	.995	.990	.992	1.010		1.014		.957	.385	-.415	-.416	61	1.169
.550	.995	.988	.983	.993	1.027	1.006	1.024	.986	.550	-.405	-.406	62	1.170
.696	.994	1.003	1.023	1.030	1.007	.942	.984	1.000	.696	-.404	-.403	63	1.173
.767	1.015	.982	1.038	1.178	.994	1.037	1.047	1.037	.767	-.404	-.402	64	1.155
.850	1.014	.976	1.108	1.126	.962	1.054	1.025	1.101	.850	-.404	-.389	65*	1.153
.932	1.024	.992	1.142	1.137	.885	1.162	1.144	1.137	.932	-.388	-.382	66*	1.132
$\alpha = 4^o$; $\phi_m = -60^o$													
.385	1.000	.992	.996	1.014		.996		.996	.385	-.399	-.415	61	1.168
.550	1.003	.992	.995	1.035	.955	1.002	1.032	.999	.550	-.392	-.403	62	1.179
.696	1.007	.985	1.004	1.062	.944	1.018	1.042	1.016	.696	-.398	-.398	63	1.171
.767	1.050	.982	.972	1.137	.967	1.100	1.064	1.075	.767	-.403	-.396	64	1.136
.850	1.070	.955	.962	1.134	.961	1.145	1.031	1.131	.850	-.399	-.382	65*	1.151
.932	1.126	1.069	1.019	1.145	.929	1.154	1.150	1.145	.932	-.375	-.372	66*	1.116
$\alpha = 4^o$; $\phi_m = -120^o$													
.385	1.050	1.034	1.034	.988		1.032		1.039	.385	-.407	-.430	61	1.128
.550	.974	.991	.998	.978	1.014	1.021	.999	1.027	.550	-.402	-.424	62	1.140
.656	1.078	1.001	1.014	1.010	.955	1.039	.973	1.057	.696	-.408	-.421	63	1.133
.767	1.148	1.067	.999	1.010	.949	1.055	1.037	1.075	.767	-.413	-.424	64	1.112
.850	1.170	1.124	1.004	1.052	.902	1.122	1.003	1.128	.850	-.412	-.409	65*	1.105
.932	1.128	1.126	1.051	1.159	.871	1.153	1.096	1.159	.932	-.389	-.396	66*	1.069
$\alpha = 4^o$; $\phi_m = -180^o$													
.385	1.058	1.042	1.031	1.013		1.015		1.024	.385	-.367	-.363	61	1.167
.550	.987	.993	1.022	.996	.999	.982	1.022	.995	.550	-.361	-.353	62	1.175
.696	1.103	1.029	1.012	.993	.973	.967	.943	.978	.696	-.361	-.352	63	1.167
.767	1.156	1.088	1.031	1.107	.966	.969	1.056	1.008	.767	-.363	-.356	64	1.135
.850	1.174	1.137	.975	1.135	.965	.975	1.024	1.014	.850	-.350	-.344	65*	1.105
.932	1.133	1.132	1.141	1.152	.853	1.098	1.139	1.152	.932	-.330	-.337	66*	1.094

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(c) $M = 0.8$; $\alpha = 6^{\circ}$ and 9° - Continued

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 6^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.980	.983	.992	1.019		1.021		.992	.385	-.435	-.430	61	1.163
.550	.985	.983	.974	.998	1.039	1.018	1.019	.993	.550	-.424	-.422	62	1.177
.696	.990	.995	1.028	1.026	1.016	.947	1.001	.982	.696	-.422	-.418	63	1.177
.767	.993	.967	1.043	1.174	1.004	1.057	1.053	1.044	.767	-.423	-.416	64	1.162
.850	.996	.986	1.110	1.127	.968	1.093	1.024	1.107	.850	-.425	-.409	65*	1.161
.932	.936	.948	1.131	1.128	.916	1.159	1.145	1.128	.932	-.403	-.400	66*	1.139
$\alpha = 6^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.998	.992	1.000	1.022		1.021		1.005	.385	-.425	-.444	61	1.166
.550	1.030	.992	.993	1.046	.954	1.022	1.052	1.013	.550	-.410	-.427	62	1.179
.696	1.001	.995	.999	1.073	.942	1.057	1.052	1.030	.696	-.415	-.414	63	1.174
.767	1.037	.976	.962	1.078	.954	1.126	1.076	1.090	.767	-.422	-.415	64	1.145
.850	1.050	.912	.946	1.136	.938	1.156	1.043	1.138	.850	-.421	-.397	65*	1.152
.932	1.119	1.053	.972	1.144	.937	1.152	1.149	1.144	.932	-.393	-.385	66*	1.121
$\alpha = 6^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.053	1.040	1.040	1.035		1.036		1.043	.385	-.381	-.411	61	1.166
.550	.992	.996	.993	1.025	1.010	1.029	1.040	1.036	.550	-.374	-.395	62	1.182
.696	1.071	1.033	1.003	1.060	.936	1.060	1.024	1.022	.696	-.380	-.389	63	1.178
.767	1.150	1.081	.977	1.034	.936	1.074	1.077	1.077	.767	-.379	-.391	64	1.162
.850	1.170	1.129	.992	1.063	.884	1.132	1.051	1.101	.850	-.383	-.380	65*	1.144
.932	1.125	1.119	.983	1.125	.852	1.150	1.139	1.125	.932	-.362	-.370	66*	1.104
$\alpha = 6^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.066	1.053	1.029	.995		1.009		1.023	.385	-.388	-.365	61	1.169
.550	1.000	1.002	1.002	.999	.988	.986	1.019	1.006	.550	-.379	-.361	62	1.182
.696	1.111	1.058	1.018	.991	.965	.968	.949	.987	.696	-.372	-.358	63	1.179
.767	1.157	1.109	1.020	1.071	.957	.960	1.048	1.012	.767	-.369	-.358	64	1.150
.850	1.171	1.145	.965	1.123	.951	.962	1.024	.981	.850	-.355	-.352	65*	1.098
.932	1.132	1.134	1.073	1.102	.830	1.046	1.133	1.102	.932	-.336	-.345	66*	1.083
$\alpha = 9^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.961	.970	.991	1.033		1.043		.991	.385	-.454	-.457	61	1.159
.550	.965	.967	.969	1.022	1.040	1.029	1.023	.997	.550	-.445	-.447	62	1.178
.696	.982	.986	1.029	1.006	1.036	.996	1.016	.993	.696	-.437	-.438	63	1.179
.767	.977	.947	1.035	1.161	1.027	1.085	1.056	1.045	.767	-.442	-.432	64	1.171
.850	.976	.957	1.132	1.127	.995	1.104	1.032	1.103	.850	-.448	-.425	65*	1.177
.932	.896	.899	1.120	1.116	.985	1.159	1.145	1.116	.932	-.434	-.415	66*	1.153
$\alpha = 9^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.996	.989	.995	1.022		1.049		1.014	.385	-.462	-.477	61	1.161
.550	.998	.988	.986	1.050	.957	1.046	1.070	1.030	.550	-.448	-.461	62	1.179
.696	.967	.985	.993	1.050	.936	1.090	1.070	1.040	.696	-.450	-.448	63	1.181
.767	1.028	.970	.948	1.044	.971	1.142	1.093	1.099	.767	-.455	-.443	64	1.157
.850	1.051	.919	.943	1.110	.958	1.152	1.063	1.136	.850	-.466	-.426	65*	1.150
.932	1.117	1.021	.925	1.143	1.003	1.154	1.154	1.143	.932	-.443	-.413	66*	1.121
$\alpha = 9^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.058	1.039	1.031	1.028		1.039		1.056	.385	-.406	-.433	61	1.159
.550	.996	1.015	.980	1.028	1.002	1.031	1.046	1.047	.550	-.395	-.427	62	1.179
.696	1.115	1.072	1.000	1.054	.903	1.075	1.029	1.023	.696	-.392	-.414	63	1.181
.767	1.152	1.086	.933	1.010	.912	1.091	1.071	1.101	.767	-.393	-.413	64	1.168
.850	1.167	1.131	.954	1.033	.868	1.138	1.052	1.105	.850	-.398	-.401	65*	1.139
.932	1.125	1.106	.926	1.076	.800	1.139	1.133	1.076	.932	-.379	-.390	66*	1.091
$\alpha = 9^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.085	1.071	1.020	.975		.997		1.021	.385	-.417	-.392	61	1.161
.550	1.031	1.024	.984	.998	.965	.977	1.012	1.001	.550	-.403	-.387	62	1.180
.696	1.126	1.094	1.009	.997	.953	.967	1.033	1.007	.696	-.398	-.378	63	1.182
.767	1.162	1.124	1.018	1.040	.943	.940	1.042	1.021	.767	-.393	-.376	64	1.163
.850	1.172	1.149	1.014	1.106	.940	.950	1.032	.976	.850	-.375	-.357	65*	1.079
.932	1.142	1.133	.969	1.026	.806	.958	1.130	1.026	.932	-.358	-.362	66*	1.059

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(c) $M = 0.8$; $\alpha = 16^{\circ}$ and 24° - Concluded

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
Windward face									Leeward face				
$\alpha = 16^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.902	.896	.962	1.052		1.086		.969	.385	-.492	-.492	61	1.126
.550	.921	.917	.943	1.047	1.061	1.047	1.038	.992	.550	-.486	-.484	62	1.157
.696	.940	.934	.992	1.046	1.057	1.075	1.048	.934	.696	-.479	-.474	63	1.170
.767	.921	.886	.996	1.162	1.114	1.145	1.084	.994	.767	-.477	-.474	64	1.179
.850	.922	.893	1.062	1.123	1.105	1.154	1.051	1.054	.850	-.478	-.464	65*	1.178
.932	.790	.821	1.074	1.072	1.020	1.149	1.140	1.072	.932	-.459	-.458	66*	1.171
$\alpha = 16^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.965	.954	.977	1.018		1.081		1.024	.385	-.510	-.517	61	1.129
.550	.966	.955	.956	1.037	.976	1.075	1.082	1.054	.550	-.499	-.503	62	1.161
.696	.947	.968	.963	1.021	.947	1.133	1.063	1.053	.696	-.503	-.488	63	1.175
.767	.941	.882	.893	.940	1.015	1.156	1.106	1.096	.767	-.511	-.480	64	1.177
.850	.911	.892	.888	.974	1.043	1.166	1.077	1.126	.850	-.520	-.464	65*	1.138
.932	1.015	.805	.857	1.142	1.014	1.160	1.165	1.142	.932	-.488	-.456	65*	1.113
$\alpha = 16^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.090	1.058	1.058	1.038		1.000		1.043	.385	-.442	-.473	61	1.130
.550	1.051	1.033	.964	1.028	.966	1.008	1.044	1.052	.550	-.436	-.463	62	1.162
.696	1.065	1.041	.998	1.046	.843	1.112	1.031	1.029	.696	-.429	-.447	63	1.175
.767	1.142	1.083	.781	.968	.873	1.116	1.055	1.108	.767	-.424	-.443	64	1.180
.850	1.155	1.111	.865	.975	.826	1.139	1.044	1.132	.850	-.431	-.432	65*	1.103
.932	1.117	1.069	.819	1.165	.657	1.111	1.117	1.165	.932	-.420	-.426	65*	1.058
$\alpha = 16^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.117	1.113	1.008	.936		.982		1.006	.385	-.474	-.442	61	1.131
.550	1.097	1.090	.938	.950	.940	.945	.991	.975	.550	-.461	-.441	62	1.164
.696	1.141	1.139	.940	1.060	.908	.940	1.015	.997	.696	-.452	-.429	63	1.176
.767	1.164	1.145	.916	1.016	.903	.903	1.021	.984	.767	-.445	-.422	64	1.178
.850	1.172	1.151	.946	1.069	.888	.906	1.031	.999	.850	-.424	-.407	65*	1.019
.932	1.158	1.139	.936	.980	.737	.836	1.082	.980	.932	-.402	-.400	66*	.998
$\alpha = 24^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.817	.789	.943	1.044		1.111		.940	.385	-.531	-.531	61	1.070
.550	.842	.833	.935	1.054	1.079	1.072	1.064	.932	.550	-.526	-.526	62	1.117
.696	.854	.880	.924	1.039	1.078	1.120	1.058	.927	.696	-.519	-.520	63	1.141
.767	.843	.794	.932	1.138	1.141	1.146	1.076	.904	.767	-.517	-.517	64	1.166
.850	.841	.816	.993	1.109	1.131	1.144	1.066	.992	.850	-.513	-.513	65*	1.175
.932	.718	.699	1.010	1.016	1.072	1.146	1.121	1.016	.932	-.495	-.508	65*	1.180
$\alpha = 24^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.931	.910	.945	1.000		1.064		1.008	.385	-.540	-.537	61	1.078
.550	.939	.908	.904	1.023	.949	1.066	1.089	1.040	.550	-.533	-.527	62	1.122
.696	.918	.926	.909	1.007	.924	1.129	1.059	1.037	.696	-.540	-.510	63	1.147
.767	.915	.823	.825	.900	1.002	1.150	1.099	1.072	.767	-.552	-.508	64	1.177
.850	.824	.815	.823	.747	1.042	1.155	1.077	1.097	.850	-.566	-.496	65*	1.105
.932	.966	.696	.785	1.133	1.001	1.159	1.178	1.133	.932	-.538	-.488	66*	1.089
$\alpha = 24^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.066	1.031	1.011	.995		.948		1.035	.385	-.511	-.538	61	1.079
.550	1.059	1.030	.911	.990	.919	1.031	1.020	1.052	.550	-.502	-.529	62	1.119
.696	1.090	1.043	.952	1.006	.763	1.023	.978	1.020	.696	-.490	-.510	63	1.141
.767	1.122	1.066	.654	.868	.796	1.114	1.011	1.113	.767	-.478	-.504	64	1.166
.850	1.130	1.077	.794	.921	.807	1.123	1.014	1.139	.850	-.504	-.494	65*	1.050
.932	1.096	1.017	.751	1.157	.738	1.068	1.082	1.157	.932	-.506	-.486	66*	.997
$\alpha = 24^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.115	1.103	.980	.894		.945		.982	.385	-.508	-.487	61	1.072
.550	1.119	1.105	.907	.905	.985	.897	.930	.958	.550	-.503	-.489	62	1.116
.696	1.149	1.138	.874	1.009	.854	.890	.926	.952	.696	-.499	-.478	63	1.146
.767	1.168	1.147	.863	.916	.848	.855	.925	.923	.767	-.488	-.462	64	1.172
.850	1.159	1.143	.927	.965	.831	.855	.962	.947	.850	-.466	-.444	65*	.936
.932	1.170	1.133	1.012	1.012	.666	.759	.959	1.012	.932	-.438	-.430	66*	.919

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(d) M = 0.9; $\alpha = 0^{\circ}$ and 4°

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 0^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.092	1.089	1.096	1.073		1.074		1.071	.385	-.381	-.378	61	1.219
.550	1.026	1.050	1.058	1.043	1.057	1.053	1.081	1.050	.550	-.375	-.372	52	1.224
.696	1.053	.992	.994	1.065	1.036	1.030	1.020	1.062	.696	-.375	-.370	63	1.215
.767	1.180	1.085	1.079	1.199	1.036	1.057	1.113	1.090	.767	-.376	-.375	54	1.191
.850	1.213	1.131	1.124	1.181	1.029	1.048	1.079	1.114	.850	-.368	-.361	65*	1.180
.932	1.170	1.187	1.203	1.203	.942	1.186	1.193	1.203	.932	-.349	-.356	66*	1.168
$\alpha = 0^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.098	1.080	1.092	1.066		1.072		1.072	.385	-.381	-.385	61	1.218
.550	1.038	1.067	1.062	1.047	1.057	1.052	1.077	1.055	.550	-.374	-.376	62	1.223
.696	1.056	1.001	.996	1.071	1.039	1.035	1.016	1.077	.696	-.377	-.374	53	1.210
.767	1.145	1.083	1.081	1.203	1.041	1.057	1.110	1.089	.767	-.375	-.374	54	1.176
.850	1.138	1.105	1.123	1.177	1.026	1.056	1.077	1.112	.850	-.369	-.367	55*	1.197
.932	1.177	1.182	1.205	1.206	.932	1.184	1.190	1.206	.932	-.348	-.358	56*	1.164
$\alpha = 0^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.087	1.075	1.084	1.061		1.060		1.071	.385	-.382	-.382	61	1.216
.550	1.049	1.070	1.051	1.047	1.052	1.047	1.070	1.051	.550	-.372	-.375	62	1.221
.696	1.046	1.048	.981	1.063	1.031	1.009	1.015	1.070	.696	-.372	-.374	63	1.210
.767	1.157	1.076	1.080	1.199	1.029	1.064	1.105	1.088	.767	-.375	-.374	54	1.181
.850	1.185	1.085	1.119	1.178	1.016	1.065	1.072	1.109	.850	-.370	-.364	55*	1.195
.932	1.179	1.172	1.204	1.210	.937	1.196	1.192	1.210	.932	-.350	-.356	56*	1.164
$\alpha = 0^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.095	1.091	1.101	1.071		1.079		1.075	.385	-.385	-.381	61	1.218
.550	1.030	1.053	1.063	1.045	1.060	1.060	1.080	1.055	.550	-.374	-.373	52	1.223
.696	1.050	.998	.993	1.065	1.042	1.031	1.017	1.075	.696	-.376	-.372	63	1.207
.767	1.181	1.089	1.084	1.197	1.043	1.066	1.111	1.096	.767	-.375	-.372	54	1.171
.850	1.216	1.134	1.124	1.180	1.031	1.063	1.079	1.123	.850	-.367	-.361	65*	1.182
.932	1.173	1.190	1.207	1.206	.941	1.199	1.193	1.206	.932	-.346	-.357	66*	1.171
$\alpha = 4^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.047	1.046	1.044	1.063		1.062		1.052	.385	-.433	-.433	61	1.215
.550	1.047	1.041	1.033	1.048	1.081	1.059	1.076	1.041	.550	-.426	-.423	62	1.227
.696	1.047	1.055	1.073	1.082	1.062	.998	1.039	1.059	.696	-.421	-.417	53	1.222
.767	1.066	1.040	1.090	1.225	1.051	1.088	1.099	1.088	.767	-.421	-.415	54	1.204
.850	1.057	1.029	1.159	1.174	1.016	1.106	1.074	1.150	.850	-.421	-.405	55*	1.204
.932	1.075	1.046	1.191	1.187	.942	1.209	1.194	1.187	.932	-.401	-.396	65*	1.180
$\alpha = 4^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.052	1.046	1.049	1.068		1.050		1.050	.385	-.422	-.442	61	1.218
.550	1.064	1.048	1.049	1.089	1.013	1.057	1.086	1.052	.550	-.412	-.427	52	1.228
.696	1.061	1.041	1.059	1.112	1.001	1.073	1.095	1.068	.696	-.419	-.418	53	1.221
.767	1.102	1.039	1.027	1.187	1.020	1.152	1.116	1.124	.767	-.429	-.417	54	1.188
.850	1.120	1.015	1.017	1.183	1.016	1.197	1.082	1.181	.850	-.424	-.398	55*	1.201
.932	1.175	1.121	1.074	1.193	.983	1.202	1.198	1.193	.932	-.392	-.386	55*	1.168
$\alpha = 4^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.101	1.087	1.083	1.079		1.085		1.098	.385	-.373	-.402	61	1.218
.550	1.028	1.043	1.048	1.076	1.066	1.070	1.093	1.078	.550	-.363	-.392	52	1.230
.696	1.133	1.052	1.064	1.101	1.009	1.092	1.069	1.106	.696	-.369	-.387	53	1.223
.767	1.196	1.116	1.052	1.105	1.003	1.104	1.129	1.124	.767	-.372	-.391	54	1.202
.850	1.218	1.172	1.057	1.141	.960	1.168	1.098	1.174	.850	-.369	-.372	55*	1.195
.932	1.174	1.177	1.098	1.203	.927	1.199	1.190	1.203	.932	-.340	-.360	65*	1.160
$\alpha = 4^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.111	1.098	1.089	1.067		1.072		1.082	.385	-.375	-.357	61	1.219
.550	1.045	1.052	1.079	1.055	1.058	1.041	1.076	1.054	.550	-.366	-.352	62	1.228
.696	1.153	1.085	1.071	1.050	1.032	1.026	.999	1.039	.696	-.365	-.355	63	1.220
.767	1.207	1.142	1.085	1.159	1.021	1.027	1.108	1.068	.767	-.363	-.359	54	1.190
.850	1.226	1.187	1.035	1.185	1.021	1.032	1.077	1.070	.850	-.346	-.350	55*	1.162
.932	1.183	1.184	1.192	1.206	.914	1.151	1.190	1.206	.932	-.327	-.340	56*	1.147

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(d) M = 0.9; $\alpha = 6^{\circ}$ and 9° - Continued

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 6^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.028	1.031	1.046	1.068		1.071		1.045	.385	-.452	-.450	51	1.214
.550	1.037	1.029	1.023	1.049	1.087	1.066	1.071	1.047	.550	-.440	-.442	62	1.226
.696	1.042	1.043	1.077	1.079	1.066	.999	1.055	1.032	.696	-.436	-.433	63	1.225
.767	1.044	1.014	1.090	1.223	1.056	1.106	1.105	1.094	.767	-.438	-.430	54	1.210
.850	1.047	1.034	1.157	1.176	1.019	1.138	1.077	1.155	.850	-.439	-.420	65*	1.213
.932	.988	.995	1.178	1.174	.964	1.205	1.194	1.174	.932	-.416	-.410	55*	1.188
$\alpha = 6^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.053	1.048	1.052	1.076		1.074		1.060	.385	-.448	-.464	61	1.215
.550	1.057	1.048	1.045	1.103	1.009	1.074	1.102	1.065	.550	-.434	-.450	62	1.226
.696	1.056	1.052	1.051	1.125	.995	1.107	1.106	1.080	.696	-.437	-.437	63	1.222
.767	1.092	1.032	1.020	1.125	1.009	1.177	1.128	1.140	.767	-.444	-.436	64	1.194
.850	1.102	.970	1.003	1.184	.995	1.206	1.095	1.182	.850	-.450	-.416	55*	1.199
.932	1.167	1.104	1.025	1.194	.995	1.202	1.201	1.194	.932	-.420	-.404	56*	1.165
$\alpha = 6^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.103	1.092	1.091	1.086		1.087		1.096	.385	-.393	-.427	51	1.215
.550	1.044	1.047	1.044	1.078	1.061	1.081	1.090	1.085	.550	-.383	-.413	52	1.229
.696	1.119	1.083	1.056	1.110	.991	1.109	1.075	1.076	.696	-.383	-.401	53	1.227
.767	1.197	1.135	1.027	1.083	.990	1.123	1.126	1.125	.767	-.388	-.404	54	1.211
.850	1.216	1.181	1.044	1.114	.940	1.178	1.102	1.148	.850	-.387	-.388	65*	1.196
.932	1.172	1.166	1.036	1.169	.908	1.196	1.187	1.169	.932	-.364	-.379	56*	1.154
$\alpha = 6^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.120	1.105	1.083	1.050		1.064		1.082	.385	-.404	-.381	51	1.217
.550	1.060	1.058	1.060	1.055	1.043	1.041	1.071	1.063	.550	-.390	-.371	52	1.230
.696	1.166	1.111	1.072	1.045	1.023	1.023	1.015	1.045	.696	-.388	-.357	63	1.225
.767	1.206	1.159	1.073	1.119	1.011	1.014	1.100	1.068	.767	-.385	-.369	64	1.198
.850	1.220	1.193	1.022	1.169	1.007	1.016	1.077	1.037	.850	-.369	-.364	55*	1.150
.932	1.182	1.183	1.119	1.151	.892	1.094	1.184	1.151	.932	-.348	-.357	55*	1.134
$\alpha = 9^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.019	1.025	1.044	1.091		1.094		1.047	.385	-.467	-.463	61	1.204
.550	1.023	1.022	1.024	1.080	1.092	1.081	1.076	1.054	.550	-.457	-.455	52	1.225
.696	1.038	1.043	1.083	1.061	1.091	1.049	1.070	1.047	.696	-.453	-.448	53	1.228
.767	1.032	1.003	1.088	1.212	1.081	1.134	1.110	1.095	.767	-.454	-.445	54	1.220
.850	1.035	1.015	1.152	1.176	1.049	1.151	1.088	1.153	.850	-.466	-.436	55*	1.223
.932	.956	.955	1.170	1.166	1.043	1.208	1.198	1.166	.932	-.448	-.428	56*	1.203
$\alpha = 9^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.050	1.041	1.050	1.079		1.104		1.069	.385	-.468	-.478	51	1.211
.550	1.052	1.044	1.041	1.105	1.013	1.101	1.124	1.085	.550	-.458	-.468	62	1.229
.696	1.023	1.039	1.047	1.103	.996	1.137	1.122	1.097	.696	-.459	-.453	53	1.229
.767	1.082	1.027	1.002	1.100	1.028	1.194	1.148	1.153	.767	-.463	-.449	54	1.209
.850	1.105	.978	.998	1.160	1.014	1.214	1.117	1.188	.850	-.473	-.431	55*	1.200
.932	1.165	1.071	.981	1.194	1.055	1.205	1.207	1.194	.932	-.447	-.418	56*	1.172
$\alpha = 9^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.118	1.091	1.083	1.081		1.090		1.108	.385	-.414	-.443	61	1.209
.550	1.049	1.067	1.035	1.077	1.054	1.083	1.096	1.100	.550	-.406	-.431	52	1.232
.696	1.164	1.124	1.053	1.106	.960	1.127	1.083	1.076	.696	-.400	-.420	53	1.228
.767	1.200	1.136	.989	1.062	.971	1.143	1.122	1.151	.767	-.399	-.418	64	1.218
.850	1.216	1.179	1.009	1.084	.925	1.188	1.102	1.152	.850	-.400	-.407	55*	1.190
.932	1.174	1.156	.981	1.127	.858	1.186	1.181	1.127	.932	-.375	-.399	56*	1.144
$\alpha = 9^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.138	1.124	1.077	1.031		1.053		1.075	.385	-.438	-.406	61	1.210
.550	1.086	1.083	1.039	1.052	1.024	1.035	1.070	1.055	.550	-.421	-.399	62	1.229
.696	1.177	1.147	1.060	1.052	1.011	1.025	1.054	1.062	.696	-.415	-.390	53	1.229
.767	1.209	1.178	1.069	1.091	1.002	.998	1.097	1.075	.767	-.409	-.388	54	1.211
.850	1.222	1.201	1.071	1.156	.996	1.008	1.089	1.031	.850	-.395	-.383	55*	1.130
.932	1.191	1.185	1.027	1.074	.866	1.015	1.179	1.074	.932	-.372	-.378	56*	1.113

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(d) M = 0.9; $\alpha = 16^{\circ}$ and 24° - Concluded

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 16^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.958	.952	1.016	1.103		1.140		1.025	.385	-.498	-.497	61	1.175
.550	.978	.972	1.002	1.100	1.110	1.103	1.087	1.048	.550	-.491	-.491	52	1.204
.696	.995	.990	1.046	1.099	1.109	1.125	1.101	.989	.696	-.482	-.486	53	1.220
.767	.977	.943	1.051	1.211	1.164	1.194	1.135	1.048	.767	-.480	-.482	54	1.228
.850	.979	.952	1.108	1.173	1.156	1.204	1.104	1.108	.850	-.478	-.475	55*	1.227
.932	.849	.876	1.124	1.125	1.071	1.200	1.188	1.125	.932	-.461	-.468	66*	1.719
$\alpha = 16^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.021	1.008	1.031	1.074		1.132		1.077	.385	-.514	-.516	51	1.181
.550	1.023	1.011	1.010	1.095	1.030	1.126	1.139	1.105	.550	-.503	-.506	62	1.211
.696	1.002	1.022	1.013	1.076	1.004	1.183	1.123	1.105	.696	-.504	-.489	63	1.225
.767	.999	.939	.948	.998	1.069	1.205	1.161	1.146	.767	-.510	-.485	54	1.222
.850	.971	.948	.944	1.031	1.100	1.215	1.136	1.175	.850	-.512	-.473	55*	1.187
.932	1.069	.865	.916	1.191	1.068	1.206	1.216	1.191	.932	-.480	-.466	55*	1.165
$\alpha = 16^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.138	1.109	1.108	1.088		1.053		1.092	.385	-.453	-.477	61	1.180
.550	1.101	1.087	1.018	1.080	1.021	1.065	1.098	1.100	.550	-.446	-.468	62	1.209
.696	1.114	1.092	1.050	1.099	.900	1.164	1.083	1.076	.696	-.438	-.455	63	1.223
.767	1.189	1.135	.838	1.019	.928	1.165	1.106	1.158	.767	-.430	-.452	54	1.227
.850	1.202	1.159	.920	1.028	.886	1.188	1.095	1.178	.850	-.436	-.443	55*	1.152
.932	1.166	1.120	.875	1.210	.721	1.150	1.168	1.210	.932	-.421	-.435	56*	1.107
$\alpha = 16^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.159	1.165	1.065	.991		1.038		1.061	.385	-.483	-.457	61	1.180
.550	1.152	1.144	.998	1.005	.994	1.003	1.042	1.032	.550	-.472	-.453	52	1.211
.695	1.192	1.190	.999	1.112	.965	.998	1.065	1.051	.696	-.465	-.443	63	1.225
.767	1.216	1.193	.974	1.068	.961	.959	1.072	1.037	.767	-.457	-.436	54	1.227
.850	1.220	1.199	1.003	1.117	.945	.967	1.083	1.050	.850	-.438	-.426	55*	1.073
.932	1.206	1.186	.994	1.034	.796	.895	1.131	1.034	.932	-.418	-.420	66*	1.053
$\alpha = 24^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.877	.851	1.002	1.097		1.161		.994	.385	-.540	-.540	51	1.120
.550	.902	.894	.994	1.105	1.129	1.124	1.114	.986	.550	-.536	-.536	52	1.162
.696	.913	.937	.979	1.091	1.127	1.172	1.109	.981	.696	-.531	-.531	53	1.186
.767	.903	.854	.985	1.188	1.189	1.197	1.125	.959	.767	-.529	-.529	54	1.212
.850	.900	.877	1.046	1.157	1.180	1.199	1.117	1.045	.850	-.525	-.523	65*	1.272
.932	.783	.761	1.064	1.070	1.123	1.198	1.168	1.070	.932	-.504	-.519	55*	1.228
$\alpha = 24^{\circ}$; $\phi_m = -60^{\circ}$													
.385	.989	.970	.999	1.053		1.116		1.061	.385	-.550	-.547	61	1.127
.550	.996	.969	.962	1.071	1.004	1.118	1.137	1.092	.550	-.544	-.539	52	1.167
.696	.976	.985	.967	1.059	.980	1.177	1.108	1.090	.696	-.547	-.524	63	1.196
.767	.973	.886	.885	.958	1.053	1.202	1.147	1.123	.767	-.555	-.518	54	1.222
.850	.884	.880	.880	.803	1.095	1.207	1.127	1.147	.850	-.558	-.511	55*	1.154
.932	1.022	.762	.846	1.183	1.053	1.210	1.226	1.183	.932	-.526	-.504	56*	1.135
$\alpha = 24^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.118	1.079	1.067	1.050		1.002		1.092	.385	-.519	-.543	61	1.132
.550	1.110	1.079	.969	1.043	.975	1.083	1.074	1.106	.550	-.516	-.535	62	1.170
.696	1.140	1.093	1.007	1.060	.825	1.074	1.037	1.076	.696	-.504	-.520	63	1.193
.767	1.173	1.113	.718	.925	.855	1.161	1.066	1.167	.767	-.496	-.515	54	1.218
.850	1.181	1.125	.853	.979	.863	1.169	1.070	1.190	.850	-.515	-.507	65*	1.106
.932	1.145	1.068	.812	1.210	.796	1.117	1.135	1.210	.932	-.508	-.499	66*	1.055
$\alpha = 24^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.162	1.150	1.034	.950		.996		1.036	.385	-.514	-.502	51	1.122
.550	1.169	1.149	.965	.962	.940	.948	.984	1.010	.550	-.512	-.503	62	1.165
.696	1.195	1.185	.930	1.063	.909	.943	.982	1.004	.696	-.506	-.492	53	1.195
.767	1.213	1.195	.922	.973	.902	.909	.978	.977	.767	-.497	-.478	64	1.224
.850	1.215	1.190	.980	1.019	.887	.910	1.017	1.000	.850	-.478	-.461	65*	.994
.932	1.215	1.178	1.061	1.063	.726	.815	1.014	1.063	.932	-.456	-.453	66*	.978

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(e) $M = 1.0$; $\alpha = 0^{\circ}$ and 4°

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 0^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.154	1.149	1.154	1.131		1.133		1.131	.385	-.407	-.408	61	1.271
.550	1.090	1.111	1.117	1.104	1.119	1.111	1.139	1.109	.550	-.397	-.400	62	1.278
.696	1.118	1.050	1.057	1.128	1.097	1.095	1.079	1.121	.696	-.399	-.397	63	1.268
.767	1.239	1.145	1.137	1.256	1.098	1.114	1.171	1.148	.767	-.401	-.400	64	1.244
.850	1.269	1.189	1.181	1.238	1.088	1.105	1.139	1.173	.850	-.393	-.386	65*	1.233
.932	1.228	1.242	1.259	1.256	1.006	1.238	1.249	1.256	.932	-.368	-.378	66*	1.223
$\alpha = 0^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.154	1.147	1.159	1.129		1.131		1.132	.385	-.411	-.406	61	1.274
.550	1.100	1.124	1.126	1.108	1.115	1.112	1.136	1.117	.550	-.400	-.400	62	1.281
.696	1.114	1.075	1.059	1.126	1.099	1.089	1.078	1.139	.696	-.400	-.397	63	1.271
.767	1.224	1.137	1.142	1.260	1.096	1.118	1.171	1.152	.767	-.402	-.402	64	1.238
.850	1.251	1.151	1.182	1.235	1.083	1.116	1.137	1.178	.850	-.387	-.389	65*	1.258
.932	1.227	1.231	1.261	1.263	.996	1.232	1.248	1.263	.932	-.363	-.380	66*	1.227
$\alpha = 0^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.150	1.143	1.145	1.126		1.123		1.132	.385	-.410	-.408	61	1.273
.550	1.110	1.134	1.116	1.112	1.117	1.112	1.137	1.115	.550	-.398	-.398	62	1.282
.696	1.109	1.098	1.038	1.134	1.101	1.083	1.084	1.130	.696	-.401	-.396	63	1.271
.767	1.220	1.145	1.142	1.260	1.098	1.127	1.172	1.152	.767	-.401	-.397	64	1.244
.850	1.243	1.160	1.181	1.240	1.085	1.135	1.139	1.175	.850	-.390	-.385	65*	1.256
.932	1.238	1.231	1.264	1.263	1.005	1.252	1.253	1.263	.932	-.365	-.376	66*	1.225
$\alpha = 0^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.156	1.155	1.162	1.135		1.141		1.138	.385	-.418	-.420	61	1.276
.550	1.093	1.115	1.126	1.110	1.127	1.125	1.147	1.117	.550	-.407	-.408	62	1.282
.696	1.113	1.063	1.057	1.131	1.108	1.093	1.086	1.139	.696	-.405	-.409	63	1.268
.767	1.240	1.149	1.146	1.258	1.107	1.129	1.177	1.157	.767	-.404	-.407	64	1.231
.850	1.274	1.194	1.186	1.242	1.093	1.127	1.145	1.185	.850	-.394	-.395	65*	1.242
.932	1.234	1.247	1.265	1.264	1.004	1.260	1.251	1.264	.932	-.373	-.385	66*	1.232
$\alpha = 4^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.109	1.108	1.105	1.122		1.130		1.114	.385	-.488	-.486	61	1.271
.550	1.112	1.103	1.094	1.112	1.143	1.121	1.136	1.102	.550	-.478	-.478	62	1.284
.696	1.109	1.116	1.140	1.146	1.122	1.063	1.101	1.120	.696	-.478	-.473	63	1.279
.767	1.127	1.100	1.154	1.281	1.113	1.148	1.163	1.149	.767	-.480	-.470	64	1.262
.850	1.126	1.090	1.219	1.232	1.079	1.164	1.137	1.209	.850	-.486	-.463	65*	1.262
.932	1.134	1.105	1.248	1.244	1.006	1.267	1.255	1.244	.932	-.463	-.453	66*	1.237
$\alpha = 4^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.119	1.112	1.118	1.131		1.117		1.115	.385	-.482	-.493	61	1.277
.550	1.128	1.112	1.115	1.152	1.078	1.123	1.151	1.118	.550	-.472	-.480	62	1.290
.696	1.126	1.107	1.125	1.175	1.068	1.140	1.156	1.133	.696	-.479	-.472	63	1.280
.767	1.164	1.104	1.093	1.244	1.089	1.216	1.179	1.192	.767	-.487	-.471	64	1.251
.850	1.182	1.082	1.085	1.239	1.085	1.257	1.145	1.243	.850	-.489	-.450	65*	1.260
.932	1.235	1.186	1.138	1.255	1.049	1.266	1.256	1.255	.932	-.453	-.437	66*	1.231
$\alpha = 4^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.165	1.149	1.147	1.147		1.149		1.151	.385	-.401	-.438	61	1.275
.550	1.094	1.108	1.115	1.141	1.131	1.135	1.157	1.143	.550	-.393	-.424	62	1.287
.696	1.195	1.116	1.130	1.164	1.076	1.156	1.134	1.169	.696	-.392	-.416	63	1.283
.767	1.256	1.180	1.115	1.170	1.069	1.171	1.194	1.189	.767	-.395	-.419	64	1.260
.850	1.277	1.233	1.123	1.203	1.027	1.230	1.151	1.237	.850	-.390	-.404	65*	1.253
.932	1.235	1.236	1.161	1.264	.998	1.259	1.249	1.264	.932	-.360	-.389	66*	1.219
$\alpha = 4^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.172	1.161	1.151	1.130		1.136		1.143	.385	-.434	-.403	61	1.274
.550	1.108	1.115	1.143	1.120	1.120	1.105	1.139	1.118	.550	-.418	-.392	62	1.287
.696	1.214	1.147	1.134	1.113	1.096	1.089	1.066	1.106	.696	-.413	-.392	63	1.279
.767	1.265	1.205	1.149	1.215	1.086	1.093	1.171	1.131	.767	-.411	-.392	64	1.248
.850	1.281	1.248	1.099	1.242	1.085	1.100	1.142	1.131	.850	-.392	-.380	65*	1.223
.932	1.239	1.242	1.251	1.264	.980	1.214	1.248	1.264	.932	-.366	-.373	66*	1.209

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(e) $M = 1.0$; $\alpha = 6^{\circ}$ and 9° - Continued

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 6^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.098	1.098	1.111	1.133		1.138		1.110	.385	-.499	-.499	61	1.269
.550	1.103	1.097	1.092	1.115	1.153	1.132	1.132	1.112	.550	-.491	-.491	62	1.284
.696	1.108	1.109	1.142	1.140	1.132	1.067	1.120	1.099	.696	-.486	-.485	63	1.283
.767	1.109	1.081	1.154	1.280	1.123	1.170	1.156	1.159	.767	-.490	-.481	64	1.269
.850	1.113	1.101	1.219	1.236	1.085	1.201	1.138	1.217	.850	-.494	-.473	65*	1.269
.932	1.051	1.062	1.240	1.238	1.037	1.266	1.254	1.238	.932	-.471	-.462	66*	1.249
$\alpha = 6^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.116	1.108	1.113	1.140		1.134		1.121	.385	-.491	-.498	61	1.273
.550	1.119	1.110	1.105	1.162	1.074	1.134	1.166	1.126	.550	-.480	-.488	62	1.285
.696	1.115	1.112	1.112	1.185	1.062	1.167	1.168	1.140	.696	-.483	-.479	63	1.280
.767	1.151	1.092	1.080	1.188	1.071	1.231	1.187	1.197	.767	-.486	-.472	64	1.254
.850	1.152	1.035	1.064	1.242	1.056	1.259	1.158	1.242	.850	-.492	-.457	65*	1.258
.932	1.224	1.161	1.086	1.249	1.056	1.257	1.258	1.248	.932	-.461	-.444	66*	1.228
$\alpha = 6^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.164	1.154	1.155	1.149		1.152		1.162	.385	-.417	-.454	61	1.275
.550	1.110	1.113	1.109	1.142	1.127	1.147	1.158	1.154	.550	-.408	-.436	62	1.287
.696	1.184	1.145	1.121	1.174	1.058	1.173	1.140	1.142	.696	-.399	-.424	63	1.287
.767	1.255	1.195	1.092	1.149	1.058	1.188	1.190	1.190	.767	-.396	-.424	64	1.266
.850	1.278	1.241	1.109	1.176	1.012	1.240	1.166	1.210	.850	-.394	-.412	65*	1.253
.932	1.235	1.228	1.100	1.232	.980	1.257	1.247	1.232	.932	-.368	-.400	66*	1.215
$\alpha = 6^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.182	1.168	1.144	1.113		1.128		1.143	.385	-.469	-.432	61	1.272
.550	1.123	1.123	1.121	1.120	1.107	1.107	1.135	1.126	.550	-.448	-.418	62	1.287
.696	1.228	1.174	1.137	1.114	1.087	1.088	1.074	1.109	.696	-.438	-.408	63	1.287
.767	1.269	1.221	1.136	1.183	1.074	1.081	1.162	1.129	.767	-.431	-.405	64	1.256
.850	1.280	1.255	1.085	1.230	1.075	1.082	1.140	1.102	.850	-.415	-.398	65*	1.209
.932	1.242	1.243	1.178	1.208	.961	1.163	1.245	1.208	.932	-.388	-.393	66*	1.194
$\alpha = 9^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.082	1.087	1.108	1.152		1.160		1.110	.385	-.511	-.536	61	1.264
.550	1.086	1.086	1.088	1.143	1.157	1.145	1.141	1.115	.550	-.507	-.504	62	1.282
.696	1.101	1.105	1.142	1.128	1.155	1.116	1.136	1.110	.696	-.500	-.497	63	1.287
.767	1.096	1.067	1.149	1.271	1.145	1.196	1.173	1.158	.767	-.496	-.494	64	1.278
.850	1.097	1.075	1.213	1.239	1.110	1.213	1.152	1.213	.850	-.499	-.486	65*	1.283
.932	1.021	1.017	1.229	1.225	1.103	1.268	1.255	1.225	.932	-.474	-.478	66*	1.262
$\alpha = 9^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.109	1.103	1.111	1.139		1.166		1.131	.385	-.510	-.519	61	1.268
.550	1.114	1.103	1.103	1.163	1.078	1.162	1.184	1.143	.550	-.500	-.508	62	1.285
.696	1.085	1.102	1.108	1.164	1.059	1.201	1.183	1.157	.696	-.498	-.497	63	1.283
.767	1.144	1.088	1.066	1.159	1.090	1.253	1.206	1.210	.767	-.503	-.493	64	1.264
.850	1.163	1.042	1.063	1.217	1.079	1.269	1.177	1.245	.850	-.510	-.479	65*	1.256
.932	1.223	1.132	1.046	1.250	1.116	1.261	1.265	1.250	.932	-.480	-.470	66*	1.229
$\alpha = 9^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.180	1.153	1.148	1.143		1.153		1.171	.385	-.452	-.478	61	1.263
.550	1.115	1.134	1.100	1.140	1.118	1.147	1.158	1.164	.550	-.440	-.464	62	1.282
.696	1.224	1.186	1.118	1.166	1.029	1.188	1.144	1.140	.696	-.429	-.448	63	1.284
.767	1.258	1.196	1.052	1.126	1.037	1.205	1.184	1.211	.767	-.424	-.443	64	1.274
.850	1.274	1.237	1.074	1.145	.993	1.248	1.164	1.215	.850	-.419	-.438	65*	1.245
.932	1.234	1.212	1.044	1.189	.930	1.246	1.238	1.189	.932	-.398	-.427	66*	1.201
$\alpha = 9^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.199	1.185	1.138	1.095		1.114		1.135	.385	-.481	-.459	61	1.266
.550	1.147	1.143	1.102	1.117	1.086	1.097	1.135	1.118	.550	-.467	-.449	62	1.285
.696	1.235	1.208	1.123	1.120	1.074	1.088	1.128	1.125	.696	-.455	-.435	63	1.287
.767	1.269	1.235	1.129	1.156	1.066	1.064	1.162	1.138	.767	-.449	-.429	64	1.268
.850	1.279	1.258	1.130	1.218	1.061	1.072	1.151	1.095	.850	-.436	-.424	65*	1.193
.932	1.250	1.240	1.088	1.133	.935	1.077	1.242	1.133	.932	-.412	-.422	66*	1.175

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(e) M = 1.0; $\alpha = 16^{\circ}$ and 24° - Concluded

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 16^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.021	1.015	1.081	1.164		1.198		1.089	.385	-.556	-.554	51	1.228
.550	1.041	1.036	1.065	1.157	1.171	1.162	1.150	1.110	.550	-.551	-.551	52	1.262
.696	1.057	1.053	1.108	1.159	1.171	1.186	1.162	1.051	.696	-.543	-.546	53	1.276
.767	1.041	1.008	1.113	1.266	1.223	1.252	1.195	1.108	.767	-.541	-.543	54	1.283
.850	1.042	1.016	1.172	1.228	1.215	1.260	1.163	1.166	.850	-.537	-.538	55*	1.282
.932	.914	.943	1.184	1.184	1.136	1.261	1.245	1.184	.932	-.516	-.533	56*	1.275
$\alpha = 16^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.086	1.071	1.094	1.136		1.193		1.137	.385	-.566	-.569	61	1.237
.550	1.088	1.073	1.074	1.156	1.095	1.188	1.201	1.167	.550	-.558	-.562	52	1.268
.696	1.068	1.086	1.077	1.138	1.071	1.242	1.195	1.168	.696	-.557	-.551	53	1.282
.767	1.064	1.002	1.014	1.062	1.134	1.263	1.221	1.208	.767	-.561	-.547	54	1.281
.850	1.035	1.014	1.008	1.087	1.161	1.271	1.196	1.234	.850	-.555	-.540	55*	1.245
.932	1.132	.931	.981	1.247	1.132	1.265	1.274	1.247	.932	-.522	-.534	56*	1.226
$\alpha = 16^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.200	1.169	1.169	1.152		1.117		1.156	.385	-.523	-.549	61	1.236
.550	1.165	1.153	1.083	1.140	1.085	1.127	1.160	1.161	.550	-.515	-.538	52	1.267
.696	1.178	1.156	1.116	1.159	.969	1.223	1.145	1.142	.696	-.504	-.522	53	1.280
.767	1.247	1.194	.907	1.082	.995	1.226	1.165	1.218	.767	-.495	-.520	54	1.283
.850	1.261	1.223	.990	1.090	.953	1.248	1.156	1.239	.850	-.499	-.512	65*	1.212
.932	1.223	1.181	.945	1.270	.794	1.218	1.226	1.270	.932	-.476	-.506	56*	1.167
$\alpha = 16^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.228	1.220	1.127	1.056		1.100		1.122	.385	-.538	-.524	61	1.238
.550	1.210	1.202	1.061	1.069	1.059	1.065	1.134	1.094	.550	-.531	-.521	52	1.267
.696	1.248	1.245	1.062	1.175	1.032	1.061	1.129	1.112	.696	-.523	-.508	53	1.282
.767	1.273	1.253	1.038	1.134	1.026	1.026	1.134	1.096	.767	-.512	-.498	54	1.284
.850	1.278	1.259	1.068	1.181	1.010	1.027	1.145	1.107	.850	-.500	-.485	55*	1.135
.932	1.265	1.243	1.060	1.091	.865	.961	1.190	1.091	.932	-.474	-.481	56*	1.114
$\alpha = 24^{\circ}$; $\phi_m = 0^{\circ}$													
.385	.946	.920	1.065	1.162		1.222		1.059	.385	-.597	-.596	61	1.180
.550	.969	.961	1.059	1.166	1.192	1.185	1.173	1.049	.550	-.596	-.594	52	1.221
.696	.979	1.003	1.042	1.154	1.194	1.231	1.172	1.048	.696	-.595	-.589	53	1.245
.767	.969	.922	1.049	1.246	1.247	1.254	1.188	1.025	.767	-.594	-.591	54	1.270
.850	.969	.944	1.107	1.216	1.240	1.255	1.132	1.107	.850	-.589	-.587	55*	1.281
.932	.852	.831	1.127	1.131	1.181	1.257	1.276	1.131	.932	-.566	-.584	56*	1.285
$\alpha = 24^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.054	1.036	1.064	1.115		1.178		1.126	.385	-.588	-.591	51	1.181
.550	1.062	1.036	1.028	1.137	1.071	1.180	1.200	1.156	.550	-.582	-.583	52	1.229
.696	1.042	1.051	1.031	1.123	1.045	1.237	1.171	1.152	.696	-.582	-.576	53	1.252
.767	1.039	.957	.952	1.028	1.117	1.259	1.208	1.183	.767	-.586	-.573	54	1.281
.850	.951	.949	.951	.875	1.156	1.265	1.198	1.207	.850	-.581	-.567	55*	1.213
.932	1.089	.836	.923	1.241	1.117	1.267	1.283	1.241	.932	-.553	-.564	56*	1.198
$\alpha = 24^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.180	1.144	1.130	1.112		1.070		1.153	.385	-.566	-.583	61	1.186
.550	1.173	1.143	1.037	1.104	1.041	1.147	1.136	1.169	.550	-.564	-.578	52	1.226
.696	1.204	1.157	1.072	1.121	.900	1.137	1.099	1.141	.696	-.552	-.567	53	1.248
.767	1.233	1.179	.793	.993	.928	1.222	1.129	1.227	.767	-.544	-.566	54	1.271
.850	1.239	1.188	.926	1.044	.937	1.230	1.131	1.249	.850	-.549	-.560	55*	1.162
.932	1.209	1.131	.885	1.267	.872	1.179	1.193	1.267	.932	-.532	-.552	66*	1.116
$\alpha = 24^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.222	1.210	1.097	1.016		1.062		1.099	.385	-.580	-.572	61	1.184
.550	1.228	1.213	1.029	1.030	1.009	1.017	1.051	1.073	.550	-.578	-.573	52	1.224
.696	1.253	1.244	.997	1.128	.978	1.010	1.048	1.071	.696	-.574	-.564	63	1.256
.767	1.271	1.254	.987	1.041	.970	.980	1.046	1.042	.767	-.564	-.554	54	1.281
.850	1.273	1.249	1.045	1.086	.955	.978	1.081	1.064	.850	-.545	-.533	65*	1.057
.932	1.271	1.237	1.124	1.122	.798	.886	1.078	1.122	.932	-.521	-.526	55*	1.039

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(f) $M = 1.2$; $\alpha = 0^{o}$ and 4^{o}

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{o}$	$\phi = 30^{o}$	$\phi = 90^{o}$	$\phi = 120^{o}$	$\phi = 180^{o}$	$\phi = 210^{o}$	$\phi = 240^{o}$	$\phi = 270^{o}$		$\phi = 150^{o}$	$\phi = 180^{o}$		Terminal descent landing radar
Windward face									Leeward face				
$\alpha = 0^{o}$; $\phi_m = 0^{o}$													
.385	1.280	1.277	1.285	1.261		1.266		1.262	.385	-.304	-.291	61	1.391
.550	1.224	1.244	1.252	1.238	1.250	1.245	1.270	1.243	.550	-.298	-.295	62	1.398
.696	1.247	1.192	1.197	1.259	1.232	1.228	1.216	1.255	.696	-.298	-.295	63	1.392
.767	1.359	1.275	1.271	1.376	1.231	1.246	1.299	1.279	.767	-.300	-.295	64	1.368
.850	1.389	1.314	1.307	1.357	1.223	1.241	1.269	1.303	.850	-.293	-.286	65*	1.360
.932	1.345	1.361	1.378	1.378	1.144	1.360	1.368	1.378	.932	-.267	-.285	66*	1.351
$\alpha = 0^{o}$; $\phi_m = -60^{o}$													
.385	1.290	1.282	1.283	1.264		1.264		1.264	.385	-.304	-.297	61	1.390
.550	1.229	1.258	1.256	1.243	1.252	1.249	1.270	1.249	.550	-.294	-.291	62	1.397
.696	1.255	1.196	1.198	1.258	1.237	1.226	1.217	1.269	.696	-.293	-.286	63	1.387
.767	1.361	1.276	1.271	1.380	1.235	1.255	1.300	1.279	.767	-.296	-.284	64	1.359
.850	1.390	1.301	1.305	1.359	1.224	1.254	1.271	1.307	.850	-.296	-.284	65*	1.376
.932	1.349	1.362	1.381	1.383	1.142	1.361	1.372	1.383	.932	-.273	-.278	66*	1.348
$\alpha = 0^{o}$; $\phi_m = -120^{o}$													
.385	1.289	1.275	1.285	1.259		1.264		1.265	.385	-.304	-.291	61	1.393
.550	1.239	1.264	1.250	1.241	1.252	1.247	1.268	1.250	.550	-.294	-.282	62	1.400
.696	1.257	1.207	1.185	1.261	1.241	1.227	1.219	1.260	.696	-.292	-.280	63	1.391
.767	1.362	1.286	1.272	1.379	1.236	1.257	1.298	1.280	.767	-.293	-.282	64	1.364
.850	1.390	1.323	1.301	1.356	1.225	1.255	1.269	1.296	.850	-.281	-.274	65*	1.378
.932	1.354	1.359	1.384	1.386	1.145	1.369	1.371	1.386	.932	-.257	-.270	66*	1.350
$\alpha = 0^{o}$; $\phi_m = -180^{o}$													
.385	1.287	1.234	1.290	1.267		1.271		1.268	.385	-.309	-.311	61	1.395
.550	1.229	1.247	1.258	1.246	1.253	1.253	1.275	1.249	.550	-.304	-.301	62	1.404
.696	1.252	1.203	1.197	1.263	1.236	1.224	1.218	1.264	.696	-.303	-.301	63	1.390
.767	1.363	1.281	1.273	1.380	1.239	1.259	1.305	1.286	.767	-.305	-.298	64	1.356
.850	1.395	1.320	1.315	1.363	1.227	1.254	1.274	1.312	.850	-.300	-.294	65*	1.366
.932	1.354	1.368	1.384	1.382	1.149	1.376	1.375	1.382	.932	-.275	-.289	66*	1.356
$\alpha = 4^{o}$; $\phi_m = 0^{o}$													
.385	1.243	1.238	1.239	1.252		1.262		1.246	.385	-.320	-.319	61	1.390
.550	1.244	1.237	1.229	1.243	1.274	1.255	1.267	1.237	.550	-.316	-.313	62	1.400
.696	1.242	1.249	1.270	1.274	1.257	1.201	1.234	1.248	.696	-.315	-.313	63	1.397
.767	1.259	1.234	1.283	1.398	1.244	1.277	1.287	1.279	.767	-.318	-.312	64	1.379
.850	1.257	1.223	1.342	1.351	1.216	1.297	1.270	1.332	.850	-.320	-.306	65*	1.380
.932	1.261	1.237	1.369	1.366	1.147	1.385	1.369	1.366	.932	-.294	-.305	66*	1.359
$\alpha = 4^{o}$; $\phi_m = -60^{o}$													
.385	1.245	1.242	1.243	1.261		1.245		1.246	.385	-.323	-.320	61	1.391
.550	1.257	1.242	1.244	1.282	1.212	1.250	1.278	1.248	.550	-.317	-.316	62	1.404
.696	1.254	1.237	1.252	1.303	1.204	1.262	1.286	1.257	.696	-.322	-.313	63	1.396
.767	1.291	1.234	1.224	1.365	1.219	1.334	1.303	1.313	.767	-.332	-.312	64	1.367
.850	1.308	1.212	1.216	1.361	1.216	1.373	1.275	1.359	.850	-.333	-.302	65*	1.380
.932	1.353	1.304	1.262	1.370	1.186	1.377	1.377	1.370	.932	-.306	-.296	66*	1.349
$\alpha = 4^{o}$; $\phi_m = -120^{o}$													
.385	1.288	1.273	1.273	1.280		1.269		1.275	.385	-.250	-.274	61	1.389
.550	1.222	1.239	1.243	1.272	1.257	1.263	1.284	1.270	.550	-.239	-.261	62	1.401
.696	1.317	1.244	1.258	1.292	1.208	1.280	1.266	1.294	.696	-.233	-.255	63	1.400
.767	1.372	1.301	1.243	1.297	1.200	1.298	1.317	1.313	.767	-.230	-.254	64	1.381
.850	1.391	1.352	1.251	1.327	1.164	1.354	1.298	1.356	.850	-.222	-.247	65*	1.373
.932	1.351	1.351	1.280	1.377	1.140	1.376	1.369	1.377	.932	-.196	-.235	66*	1.342
$\alpha = 4^{o}$; $\phi_m = -180^{o}$													
.385	1.302	1.292	1.283	1.264		1.270		1.277	.385	-.296	-.266	61	1.396
.550	1.243	1.250	1.275	1.251	1.254	1.240	1.271	1.253	.550	-.280	-.255	62	1.406
.696	1.340	1.282	1.270	1.247	1.231	1.228	1.204	1.240	.696	-.272	-.244	63	1.402
.767	1.385	1.333	1.282	1.339	1.224	1.231	1.299	1.264	.767	-.265	-.240	64	1.372
.850	1.400	1.371	1.236	1.362	1.222	1.234	1.271	1.269	.850	-.250	-.232	65*	1.350
.932	1.361	1.366	1.375	1.387	1.124	1.343	1.369	1.387	.932	-.222	-.228	66*	1.335

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS OPEN - CONTINUED

(f) M = 1.2; $\alpha = 6^{\circ}$ and 9° - Continued

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{\circ}$	$\phi = 30^{\circ}$	$\phi = 90^{\circ}$	$\phi = 120^{\circ}$	$\phi = 180^{\circ}$	$\phi = 210^{\circ}$	$\phi = 240^{\circ}$	$\phi = 270^{\circ}$		$\phi = 150^{\circ}$	$\phi = 180^{\circ}$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 6^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.230	1.230	1.241	1.261		1.268		1.244	.385	-.327	-.323	51	1.385
.550	1.236	1.230	1.225	1.245	1.283	1.262	1.261	1.244	.550	-.322	-.322	52	1.400
.696	1.240	1.241	1.273	1.269	1.263	1.203	1.250	1.234	.696	-.322	-.319	53	1.396
.767	1.241	1.216	1.282	1.397	1.254	1.296	1.293	1.289	.767	-.318	-.315	64	1.388
.850	1.244	1.233	1.341	1.354	1.221	1.326	1.270	1.339	.850	-.318	-.314	55*	1.386
.932	1.190	1.197	1.360	1.358	1.170	1.382	1.369	1.358	.932	-.291	-.310	56*	1.367
$\alpha = 6^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.248	1.243	1.246	1.269		1.268		1.253	.385	-.327	-.327	61	1.388
.550	1.252	1.246	1.244	1.293	1.211	1.266	1.294	1.259	.550	-.320	-.324	52	1.403
.696	1.251	1.246	1.248	1.313	1.201	1.294	1.295	1.272	.696	-.327	-.316	63	1.401
.767	1.284	1.231	1.218	1.316	1.212	1.354	1.315	1.326	.767	-.332	-.315	54	1.375
.850	1.293	1.176	1.204	1.362	1.197	1.382	1.288	1.364	.850	-.334	-.306	65*	1.380
.932	1.346	1.290	1.224	1.372	1.193	1.380	1.379	1.372	.932	-.300	-.299	66*	1.351
$\alpha = 6^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.294	1.282	1.285	1.282		1.282		1.292	.385	-.270	-.292	61	1.392
.550	1.243	1.247	1.243	1.274	1.257	1.277	1.284	1.282	.550	-.263	-.281	52	1.406
.696	1.311	1.272	1.254	1.302	1.198	1.299	1.274	1.273	.696	-.254	-.273	53	1.405
.767	1.378	1.320	1.231	1.281	1.196	1.314	1.316	1.315	.767	-.245	-.266	64	1.386
.850	1.396	1.364	1.241	1.303	1.153	1.363	1.291	1.337	.850	-.237	-.259	55*	1.372
.932	1.353	1.346	1.234	1.359	1.126	1.377	1.366	1.359	.932	-.216	-.250	56*	1.345
$\alpha = 6^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.309	1.299	1.276	1.255		1.261		1.275	.385	-.300	-.280	61	1.393
.550	1.252	1.254	1.255	1.255	1.242	1.240	1.270	1.258	.550	-.290	-.258	52	1.406
.696	1.351	1.301	1.269	1.249	1.224	1.224	1.215	1.242	.696	-.283	-.256	63	1.405
.767	1.386	1.345	1.266	1.314	1.215	1.218	1.298	1.260	.767	-.274	-.250	54	1.381
.850	1.398	1.375	1.222	1.357	1.211	1.220	1.276	1.237	.850	-.258	-.240	55*	1.339
.932	1.363	1.362	1.311	1.338	1.106	1.293	1.369	1.338	.932	-.232	-.235	66*	1.326
$\alpha = 9^{\circ}$; $\phi_m = 0^{\circ}$													
.385	1.217	1.222	1.239	1.279		1.284		1.242	.385	-.334	-.334	51	1.380
.550	1.221	1.222	1.221	1.271	1.283	1.269	1.265	1.246	.550	-.330	-.330	62	1.397
.696	1.234	1.237	1.272	1.257	1.278	1.246	1.263	1.241	.696	-.327	-.326	63	1.401
.767	1.229	1.203	1.277	1.389	1.271	1.319	1.295	1.285	.767	-.326	-.325	54	1.393
.850	1.231	1.213	1.332	1.356	1.239	1.336	1.278	1.335	.850	-.323	-.322	55*	1.397
.932	1.160	1.155	1.351	1.349	1.227	1.384	1.372	1.348	.932	-.301	-.319	55*	1.378
$\alpha = 9^{\circ}$; $\phi_m = -60^{\circ}$													
.385	1.244	1.237	1.246	1.272		1.290		1.262	.385	-.337	-.340	61	1.384
.550	1.248	1.237	1.236	1.294	1.213	1.286	1.311	1.276	.550	-.331	-.335	62	1.402
.696	1.221	1.234	1.241	1.294	1.200	1.322	1.311	1.286	.696	-.328	-.327	53	1.402
.767	1.276	1.223	1.205	1.288	1.226	1.368	1.330	1.336	.767	-.333	-.324	54	1.384
.850	1.299	1.178	1.201	1.342	1.212	1.385	1.302	1.366	.850	-.341	-.315	55*	1.378
.932	1.345	1.266	1.183	1.371	1.251	1.378	1.381	1.371	.932	-.309	-.307	66*	1.354
$\alpha = 9^{\circ}$; $\phi_m = -120^{\circ}$													
.385	1.306	1.282	1.279	1.276		1.284		1.300	.385	-.299	-.315	61	1.385
.550	1.248	1.263	1.235	1.272	1.252	1.279	1.291	1.291	.550	-.292	-.304	52	1.404
.696	1.347	1.311	1.252	1.297	1.171	1.316	1.279	1.270	.696	-.282	-.294	53	1.405
.767	1.380	1.324	1.196	1.259	1.179	1.329	1.312	1.336	.767	-.272	-.291	54	1.394
.850	1.393	1.363	1.213	1.274	1.139	1.369	1.291	1.343	.850	-.263	-.282	65*	1.369
.932	1.355	1.336	1.188	1.315	1.082	1.368	1.364	1.315	.932	-.243	-.277	56*	1.332
$\alpha = 9^{\circ}$; $\phi_m = -180^{\circ}$													
.385	1.323	1.310	1.269	1.232		1.250		1.268	.385	-.318	-.307	61	1.385
.550	1.276	1.273	1.240	1.249	1.225	1.237	1.253	1.252	.550	-.311	-.299	62	1.402
.696	1.358	1.327	1.260	1.247	1.212	1.225	1.258	1.258	.696	-.302	-.290	53	1.405
.767	1.389	1.358	1.270	1.288	1.207	1.202	1.288	1.268	.767	-.294	-.279	54	1.385
.850	1.397	1.380	1.261	1.342	1.199	1.209	1.281	1.232	.850	-.277	-.269	65*	1.321
.932	1.365	1.360	1.222	1.276	1.084	1.217	1.360	1.276	.932	-.255	-.263	55*	1.304

*Lander body.

TABLE I.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE

CONTROL-SYSTEM NOZZLE PORTS OPEN - CONCLUDED

(f) M = 1.2; $\alpha = 16^{o}$ and 24^{o} - Concluded

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^{o}$	$\phi = 30^{o}$	$\phi = 90^{o}$	$\phi = 120^{o}$	$\phi = 180^{o}$	$\phi = 210^{o}$	$\phi = 240^{o}$	$\phi = 270^{o}$		$\phi = 150^{o}$	$\phi = 180^{o}$		Terminal descent landing radar
	Windward face									Leeward face			
$\alpha = 16^{o}$; $\phi_m = 0^{o}$													
.385	1.166	1.163	1.218	1.294		1.324		1.224	.385	-.375	-.375	61	1.358
.550	1.181	1.176	1.202	1.287	1.298	1.286	1.281	1.247	.550	-.375	-.375	62	1.386
.696	1.200	1.196	1.244	1.292	1.299	1.310	1.288	1.194	.696	-.375	-.372	63	1.394
.767	1.185	1.154	1.248	1.386	1.346	1.372	1.322	1.246	.767	-.372	-.368	64	1.402
.850	1.183	1.160	1.304	1.353	1.337	1.382	1.292	1.299	.850	-.372	-.369	65*	1.401
.932	1.070	1.091	1.316	1.314	1.260	1.379	1.367	1.314	.932	-.350	-.367	66*	1.393
$\alpha = 16^{o}$; $\phi_m = -60^{o}$													
.385	1.226	1.212	1.234	1.271		1.325		1.276	.385	-.375	-.380	61	1.364
.550	1.226	1.217	1.217	1.289	1.233	1.318	1.328	1.300	.550	-.374	-.374	62	1.393
.696	1.211	1.226	1.220	1.274	1.209	1.367	1.312	1.299	.696	-.371	-.369	63	1.404
.767	1.209	1.155	1.161	1.207	1.268	1.388	1.348	1.337	.767	-.371	-.358	64	1.403
.850	1.182	1.162	1.159	1.239	1.293	1.395	1.321	1.361	.850	-.367	-.365	65*	1.370
.932	1.270	1.087	1.133	1.376	1.265	1.388	1.397	1.376	.932	-.338	-.360	66*	1.353
$\alpha = 16^{o}$; $\phi_m = -120^{o}$													
.385	1.326	1.302	1.301	1.284		1.254		1.291	.385	-.360	-.373	61	1.364
.550	1.294	1.280	1.223	1.277	1.225	1.262	1.295	1.296	.550	-.358	-.368	62	1.390
.696	1.306	1.290	1.248	1.292	1.121	1.349	1.280	1.272	.696	-.352	-.358	63	1.403
.767	1.373	1.324	1.075	1.226	1.140	1.350	1.301	1.344	.767	-.341	-.358	64	1.405
.850	1.334	1.347	1.136	1.230	1.102	1.373	1.291	1.361	.850	-.341	-.353	65*	1.344
.932	1.346	1.309	1.097	1.391	.961	1.347	1.357	1.391	.932	-.317	-.348	66*	1.302
$\alpha = 16^{o}$; $\phi_m = -180^{o}$													
.385	1.354	1.350	1.266	1.200		1.240		1.262	.385	-.367	-.363	61	1.364
.550	1.334	1.332	1.206	1.211	1.205	1.210	1.247	1.235	.550	-.367	-.366	62	1.393
.696	1.374	1.369	1.211	1.308	1.178	1.206	1.266	1.253	.696	-.362	-.360	63	1.406
.767	1.395	1.378	1.185	1.272	1.174	1.173	1.273	1.245	.767	-.354	-.349	64	1.406
.850	1.400	1.381	1.211	1.315	1.159	1.177	1.278	1.259	.850	-.340	-.332	65*	1.276
.932	1.384	1.366	1.202	1.246	1.030	1.118	1.326	1.246	.932	-.313	-.327	66*	1.256
$\alpha = 24^{o}$; $\phi_m = 0^{o}$													
.385	1.096	1.072	1.204	1.289		1.346		1.200	.385	-.451	-.448	61	1.311
.550	1.118	1.112	1.197	1.296	1.318	1.312	1.303	1.193	.550	-.450	-.445	62	1.348
.696	1.128	1.149	1.188	1.284	1.319	1.351	1.299	1.187	.696	-.449	-.447	63	1.371
.767	1.117	1.076	1.194	1.369	1.369	1.376	1.315	1.168	.767	-.447	-.448	64	1.392
.850	1.116	1.095	1.246	1.341	1.363	1.377	1.308	1.247	.850	-.446	-.445	65*	1.400
.932	1.009	.994	1.263	1.266	1.312	1.377	1.351	1.266	.932	-.417	-.443	65*	1.403
$\alpha = 24^{o}$; $\phi_m = -60^{o}$													
.385	1.191	1.177	1.206	1.249		1.308		1.260	.385	-.451	-.451	61	1.317
.550	1.200	1.178	1.173	1.271	1.208	1.309	1.324	1.291	.550	-.446	-.449	62	1.355
.696	1.184	1.190	1.176	1.255	1.187	1.361	1.301	1.285	.696	-.449	-.445	63	1.382
.767	1.180	1.106	1.105	1.162	1.252	1.379	1.335	1.316	.767	-.445	-.446	64	1.404
.850	1.103	1.097	1.101	1.036	1.286	1.385	1.316	1.337	.850	-.442	-.441	65*	1.345
.932	1.219	.991	1.069	1.366	1.250	1.388	1.402	1.366	.932	-.414	-.441	66*	1.330
$\alpha = 24^{o}$; $\phi_m = -120^{o}$													
.385	1.310	1.279	1.265	1.253		1.212		1.285	.385	-.435	-.441	61	1.321
.550	1.303	1.277	1.181	1.245	1.184	1.279	1.269	1.298	.550	-.436	-.442	62	1.358
.696	1.333	1.286	1.214	1.261	1.054	1.271	1.238	1.268	.696	-.430	-.436	63	1.378
.767	1.360	1.306	.961	1.146	1.081	1.348	1.263	1.352	.767	-.422	-.433	64	1.397
.850	1.367	1.320	1.076	1.187	1.083	1.357	1.263	1.373	.850	-.417	-.426	65*	1.296
.932	1.336	1.264	1.039	1.389	1.022	1.311	1.327	1.389	.932	-.396	-.421	66*	1.255
$\alpha = 24^{o}$; $\phi_m = -180^{o}$													
.385	1.351	1.342	1.240	1.165		1.210		1.241	.385	-.437	-.433	61	1.317
.550	1.356	1.343	1.177	1.176	1.159	1.155	1.197	1.218	.550	-.437	-.438	62	1.357
.696	1.381	1.372	1.150	1.270	1.131	1.160	1.194	1.213	.696	-.433	-.437	63	1.384
.767	1.397	1.379	1.137	1.178	1.122	1.132	1.188	1.187	.767	-.429	-.428	64	1.408
.850	1.399	1.376	1.189	1.216	1.110	1.132	1.229	1.204	.850	-.416	-.413	65*	1.206
.932	1.394	1.362	1.264	1.264	.966	1.043	1.229	1.264	.932	-.392	-.402	66*	1.191

*Lander body.

TABLE II.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS CLOSED

(a) $M = 0.6$; $\phi_m = 0^o$

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^o$	$\phi = 30^o$	$\phi = 90^o$	$\phi = 120^o$	$\phi = 180^o$	$\phi = 210^o$	$\phi = 240^o$	$\phi = 270^o$		$\phi = 150^o$	$\phi = 180^o$		Terminal descent landing radar
Windward face									Leeward face				
$\alpha = 0^o$													
.385	.958	.957	.968	.948		.951		.958	.385	-.410	-.410	61	1.094
.550	.902	.927	.956	.943	.952	.939	.956	.944	.550	-.398	-.393	62	1.101
.696	.896	.868	.899	.941	.922	.887	.916	.945	.696	-.398	-.391	63	1.090
.767	1.049	.953	.960	1.058	.927	.954	.934	.968	.767	-.397	-.391	64	1.063
.850	1.087	.978	.938	1.050	.894	.962	.961	.946	.850	-.389	-.382	65*	1.054
.932	1.044	1.066	1.086	1.087	.770	1.070	1.056	1.087	.932	-.378	-.378	66*	1.045
$\alpha = 4^o$													
.385	.917	.921	.936	.966		.938		.927	.385	-.425	-.430	61	1.093
.550	.919	.916	.925	.955	.978	.938	.941	.917	.550	-.414	-.425	62	1.101
.696	.919	.933	.940	.949	.986	.907	.927	.930	.696	-.416	-.417	63	1.095
.767	.930	.905	.954	1.091	.983	1.003	.962	.965	.767	-.410	-.418	64	1.078
.850	.941	.917	1.004	1.036	.889	1.036	.957	1.026	.850	-.405	-.405	65*	1.082
.932	.952	.863	1.063	1.056	.740	1.077	1.056	1.056	.932	-.388	-.397	66*	1.059
$\alpha = 6^o$													
.385	.902	.906	.928	.969		.961		.930	.385	-.444	-.441	61	1.090
.550	.910	.902	.917	.962	.998	.951	.950	.926	.550	-.429	-.433	62	1.106
.696	.923	.918	.949	.954	.999	.936	.934	.923	.696	-.420	-.425	63	1.102
.767	.918	.895	.955	1.093	.982	1.008	.974	.965	.767	-.414	-.423	64	1.087
.850	.920	.903	1.015	1.038	.881	1.032	.968	1.029	.850	-.411	-.416	65*	1.091
.932	.863	.830	1.053	1.042	.717	1.073	1.054	1.042	.932	-.392	-.407	66*	1.070
$\alpha = 9^o$													
.385	.890	.892	.924	.967		.999		.931	.385	-.464	-.463	61	1.083
.550	.900	.895	.898	.958	1.012	.979	.967	.940	.550	-.450	-.454	62	1.100
.696	.913	.914	.937	.980	.998	.964	.953	.898	.696	-.443	-.446	63	1.103
.767	.903	.885	.953	1.085	.984	1.035	.984	.968	.767	-.438	-.443	64	1.091
.850	.905	.887	1.021	1.032	.893	1.056	.980	1.027	.850	-.430	-.431	65*	1.099
.932	.803	.801	1.034	1.033	.756	1.073	1.054	1.033	.932	-.411	-.422	66*	1.079
$\alpha = 16^o$													
.385	.837	.855	.891	.988		1.008		.906	.385	-.492	-.490	61	1.052
.550	.847	.844	.866	.965	1.017	.991	.978	.915	.550	-.481	-.485	62	1.083
.696	.862	.872	.929	.979	1.010	.969	.969	.841	.696	-.475	-.471	63	1.096
.767	.846	.828	.924	1.075	1.009	1.046	.983	.922	.767	-.469	-.469	64	1.102
.850	.848	.835	.985	1.025	.986	1.068	.989	.979	.850	-.458	-.456	65*	1.104
.932	.722	.715	.991	.992	.974	1.083	1.043	.992	.932	-.438	-.449	66*	1.096
$\alpha = 24^o$													
.385	.756	.730	.868	.973		1.051		.869	.385	-.545	-.542	61	.993
.550	.784	.772	.862	.980	1.016	1.009	.986	.848	.550	-.540	-.536	62	1.034
.696	.796	.817	.861	.960	1.017	1.049	.992	.853	.696	-.528	-.524	63	1.059
.767	.776	.753	.852	1.040	1.072	1.082	.989	.822	.767	-.520	-.520	64	1.089
.850	.772	.765	.917	1.003	1.064	1.087	.990	.918	.850	-.514	-.505	65*	1.098
.932	.636	.612	.931	.937	.997	1.082	1.012	.937	.932	-.493	-.504	66*	1.099

*Lander body.

TABLE II.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS CLOSED - CONTINUED

(a) M = 0.6; ϕ_m = -180° - Concluded

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	ϕ = 0°	ϕ = 30°	ϕ = 90°	ϕ = 120°	ϕ = 180°	ϕ = 210°	ϕ = 240°	ϕ = 270°		ϕ = 150°	ϕ = 180°		Terminal descent landing radar
Windward face									Leeward face				
α = 0°													
.385	.946	.944	.962	.949		.940		.956	.385	-.406	-.411	61	1.095
.550	.896	.918	.949	.941	.946	.932	.949	.939	.550	-.397	-.400	62	1.099
.696	.897	.859	.906	.941	.917	.913	.928	.946	.696	-.398	-.398	63	1.079
.767	1.039	.945	.953	1.051	.917	.954	.980	.966	.767	-.397	-.403	64	1.042
.850	1.081	.969	.929	1.048	.881	.968	.957	.963	.850	-.390	-.391	65*	1.051
.932	1.042	1.060	1.082	1.082	.769	1.073	1.057	1.082	.932	-.371	-.380	66*	1.042
α = 4°													
.385	.984	.975	.966	.941		.951		.957	.385	-.392	-.388	61	1.096
.550	.916	.928	.950	.936	.934	.935	.967	.941	.550	-.378	-.381	62	1.105
.696	1.016	.921	.964	.933	.922	.932	.944	.943	.696	-.377	-.376	63	1.095
.767	1.078	1.014	.953	1.030	.910	.930	.990	.950	.767	-.381	-.375	64	1.061
.850	1.098	1.064	.878	1.054	.887	.880	.969	.876	.850	-.373	-.367	65*	1.037
.932	1.050	1.059	.977	1.023	.737	1.003	1.056	1.023	.932	-.360	-.356	66*	1.027
α = 6°													
.385	.998	.985	.960	.929		.949		.960	.385	-.402	-.385	61	1.094
.550	.930	.938	.928	.944	.924	.930	.959	.943	.550	-.390	-.382	62	1.106
.696	1.037	.954	.949	.954	.909	.927	.960	.949	.696	-.392	-.378	63	1.098
.767	1.080	1.034	.945	.954	.894	.916	.979	.951	.767	-.390	-.382	64	1.070
.850	1.098	1.073	.934	1.016	.879	.882	.968	.834	.850	-.379	-.367	65*	1.024
.932	1.051	1.054	.867	.910	.729	.915	1.045	.910	.932	-.365	-.361	66*	1.009
α = 9°													
.385	1.021	1.015	.966	.912		.941		.959	.385	-.412	-.392	61	1.089
.550	.964	.967	.917	.933	.907	.924	.953	.928	.550	-.402	-.385	62	1.109
.696	1.045	1.006	.921	.968	.892	.913	.969	.952	.696	-.396	-.383	63	1.104
.767	1.085	1.056	.907	.979	.886	.905	.978	.941	.767	-.396	-.380	54	1.087
.850	1.097	1.081	.911	1.011	.866	.880	.981	.924	.850	-.389	-.370	65*	1.008
.932	1.059	1.057	.870	.849	.716	.822	1.032	.849	.932	-.379	-.365	66*	.991
α = 16°													
.385	1.045	1.045	.940	.871		.910		.937	.385	-.467	-.445	61	1.057
.550	1.024	1.021	.873	.885	.856	.883	.921	.911	.550	-.453	-.435	62	1.088
.696	1.062	1.065	.871	.991	.838	.879	.932	.930	.696	-.444	-.422	63	1.102
.767	1.087	1.073	.820	.942	.828	.853	.938	.988	.767	-.443	-.413	64	1.102
.850	1.094	1.085	.863	.950	.808	.833	.954	.869	.850	-.432	-.401	65*	.947
.932	1.075	1.060	.842	.801	.642	.697	.989	.801	.932	-.412	-.393	66*	.927
α = 24°													
.385	1.038	1.030	.906	.824		.877		.906	.385	-.515	-.489	61	.996
.550	1.044	1.028	.835	.838	.813	.827	.859	.882	.550	-.504	-.487	62	1.040
.696	1.066	1.067	.803	.940	.781	.830	.857	.878	.696	-.502	-.475	63	1.069
.767	1.091	1.079	.787	.836	.770	.790	.844	.845	.767	-.490	-.465	64	1.099
.850	1.093	1.077	.846	.849	.750	.785	.890	.861	.850	-.477	-.439	65*	.860
.932	1.090	1.062	.925	.902	.563	.655	.860	.902	.932	-.458	-.425	66*	.848

*Lander body.

TABLE II.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS CLOSED - CONTINUED

(b) $M = 0.9$; $\phi_m = 0^o$

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^o$	$\phi = 30^o$	$\phi = 90^o$	$\phi = 120^o$	$\phi = 180^o$	$\phi = 210^o$	$\phi = 240^o$	$\phi = 270^o$		$\phi = 150^o$	$\phi = 180^o$		Terminal descent landing radar
Windward face									Leeward face				
$\alpha = 0^o$													
.385	1.088	1.088	1.098	1.090		1.085		1.090	.385	-.382	-.382	61	1.219
.550	1.041	1.060	1.087	1.083	1.084	1.076	1.091	1.073	.550	-.371	-.373	62	1.228
.696	1.031	1.002	1.024	1.080	1.057	1.018	1.054	1.073	.696	-.369	-.370	63	1.219
.767	1.174	1.083	1.095	1.187	1.062	1.088	1.120	1.097	.767	-.369	-.369	64	1.193
.850	1.212	1.105	1.082	1.184	1.034	1.095	1.099	1.074	.850	-.361	-.361	65*	1.184
.932	1.171	1.183	1.211	1.209	.921	1.196	1.190	1.209	.932	-.345	-.355	66*	1.176
$\alpha = 4^o$													
.385	1.058	1.058	1.073	1.058		1.073		1.062	.385	-.424	-.424	61	1.216
.550	1.058	1.056	1.060	1.088	1.111	1.076	1.072	1.054	.550	-.415	-.415	62	1.226
.696	1.060	1.071	1.069	1.089	1.111	1.043	1.060	1.058	.696	-.409	-.409	63	1.222
.767	1.070	1.045	1.092	1.218	1.113	1.129	1.098	1.094	.767	-.405	-.408	64	1.204
.850	1.080	1.056	1.132	1.170	1.034	1.163	1.093	1.153	.850	-.397	-.400	65*	1.206
.932	1.091	1.007	1.192	1.184	.904	1.202	1.187	1.184	.932	-.376	-.392	66*	1.186
$\alpha = 6^o$													
.385	1.041	1.045	1.068	1.104		1.098		1.063	.385	-.440	-.436	61	1.212
.550	1.048	1.045	1.054	1.097	1.131	1.089	1.084	1.060	.550	-.428	-.429	62	1.228
.696	1.059	1.062	1.076	1.092	1.130	1.074	1.071	1.063	.696	-.422	-.422	63	1.225
.767	1.056	1.037	1.090	1.217	1.115	1.143	1.107	1.101	.767	-.417	-.419	64	1.210
.850	1.058	1.045	1.140	1.166	1.035	1.168	1.101	1.159	.850	-.408	-.411	65*	1.212
.932	1.017	.974	1.183	1.174	.887	1.203	1.184	1.174	.932	-.384	-.400	66*	1.196
$\alpha = 9^o$													
.385	1.024	1.028	1.058	1.098		1.126		1.063	.385	-.452	-.449	61	1.205
.550	1.035	1.033	1.033	1.094	1.139	1.107	1.097	1.073	.550	-.444	-.443	62	1.223
.696	1.047	1.048	1.069	1.114	1.127	1.092	1.087	1.035	.696	-.435	-.435	63	1.228
.767	1.040	1.021	1.085	1.213	1.115	1.162	1.114	1.099	.767	-.429	-.431	64	1.215
.850	1.041	1.024	1.150	1.163	1.038	1.184	1.115	1.155	.850	-.422	-.421	65*	1.222
.932	.937	.943	1.162	1.161	.923	1.201	1.181	1.161	.932	-.398	-.413	66*	1.203
$\alpha = 16^o$													
.385	.978	.993	1.031	1.119		1.141		1.047	.385	-.467	-.468	61	1.175
.550	.986	.984	1.009	1.099	1.146	1.126	1.108	1.050	.550	-.464	-.461	62	1.205
.696	.999	1.012	1.057	1.115	1.141	1.101	1.101	.990	.696	-.456	-.456	63	1.218
.767	.988	.967	1.053	1.198	1.145	1.174	1.115	1.055	.767	-.450	-.451	64	1.225
.850	.985	.975	1.115	1.155	1.128	1.192	1.119	1.110	.850	-.443	-.440	65*	1.224
.932	.875	.863	1.171	1.121	1.109	1.209	1.170	1.121	.932	-.421	-.434	66*	1.218
$\alpha = 24^o$													
.385	.899	.873	1.009	1.109		1.175		1.012	.385	-.530	-.523	61	1.126
.550	.923	.917	1.002	1.116	1.145	1.138	1.122	.988	.550	-.521	-.517	62	1.165
.696	.934	.959	.999	1.097	1.149	1.177	1.126	.994	.696	-.515	-.511	63	1.190
.767	.917	.893	.989	1.168	1.195	1.207	1.121	.974	.767	-.509	-.509	64	1.213
.850	.912	.908	1.048	1.131	1.187	1.207	1.125	1.048	.850	-.505	-.503	65*	1.227
.932	.786	.764	1.063	1.070	1.125	1.207	1.144	1.070	.932	-.485	-.500	66*	1.231

*Lander body.

TABLE II.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS CLOSED - CONTINUED

(b) M = 0.9; ϕ_m = -180° - Concluded

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	ϕ = 0°	ϕ = 30°	ϕ = 90°	ϕ = 120°	ϕ = 180°	ϕ = 210°	ϕ = 240°	ϕ = 270°		ϕ = 150°	ϕ = 180°		Terminal descent landing radar
	Windward face								Leeward face				
α = 0°													
.385	1.085	1.085	1.097	1.089		1.076		1.092	.385	-.386	-.381	61	1.219
.550	1.042	1.056	1.088	1.080	1.083	1.069	1.086	1.080	.550	-.379	-.372	62	1.224
.696	1.030	1.001	1.037	1.081	1.055	1.056	1.064	1.085	.696	-.377	-.369	63	1.211
.767	1.171	1.081	1.090	1.165	1.058	1.091	1.117	1.100	.767	-.374	-.369	64	1.174
.850	1.211	1.100	1.069	1.183	1.029	1.101	1.096	1.088	.850	-.366	-.363	65*	1.183
.932	1.175	1.187	1.213	1.211	.929	1.203	1.189	1.211	.932	-.348	-.355	66*	1.174
α = 4°													
.385	1.116	1.109	1.097	1.077		1.084		1.091	.385	-.373	-.357	61	1.216
.550	1.050	1.062	1.080	1.071	1.069	1.070	1.101	1.077	.550	-.362	-.351	62	1.228
.696	1.144	1.053	1.098	1.071	1.060	1.066	1.079	1.074	.696	-.361	-.348	63	1.220
.767	1.203	1.144	1.088	1.157	1.048	1.065	1.121	1.084	.767	-.363	-.351	64	1.190
.850	1.222	1.188	1.017	1.181	1.028	1.020	1.104	1.018	.850	-.355	-.342	65*	1.165
.932	1.176	1.184	1.105	1.150	.895	1.126	1.188	1.150	.932	-.335	-.334	66*	1.156
α = 6°													
.385	1.131	1.122	1.097	1.069		1.084		1.093	.385	-.389	-.371	61	1.215
.550	1.067	1.076	1.067	1.082	1.060	1.068	1.094	1.077	.550	-.377	-.365	62	1.230
.696	1.166	1.092	1.082	1.092	1.049	1.063	1.096	1.087	.696	-.373	-.363	63	1.225
.767	1.208	1.164	1.080	1.115	1.033	1.054	1.112	1.084	.767	-.371	-.363	64	1.199
.850	1.221	1.199	1.072	1.133	1.021	1.022	1.103	.980	.850	-.366	-.353	65*	1.156
.932	1.180	1.181	1.011	1.030	.883	1.048	1.173	1.030	.932	-.348	-.346	66*	1.144
α = 9°													
.385	1.154	1.148	1.097	1.048		1.077		1.094	.385	-.423	-.397	61	1.210
.550	1.100	1.103	1.051	1.068	1.045	1.057	1.087	1.066	.550	-.409	-.389	62	1.225
.696	1.175	1.139	1.057	1.101	1.033	1.049	1.104	1.086	.696	-.400	-.383	63	1.226
.767	1.212	1.186	1.046	1.109	1.024	1.042	1.112	1.075	.767	-.401	-.378	64	1.208
.850	1.225	1.210	1.042	1.135	1.006	1.020	1.113	1.055	.850	-.393	-.373	65*	1.134
.932	1.186	1.186	1.008	.991	.868	.962	1.163	.991	.932	-.374	-.367	66*	1.119
α = 16°													
α = 24°													
.385	1.172	1.162	1.047	.970		1.016		1.045	.385	-.508	-.500	61	1.124
.550	1.178	1.161	.977	.983	.964	.971	1.001	1.020	.550	-.503	-.500	62	1.166
.696	1.199	1.197	.947	1.081	.930	.971	1.001	1.018	.696	-.499	-.495	63	1.195
.767	1.218	1.204	.930	.975	.917	.936	.987	.984	.767	-.494	-.486	64	1.223
.850	1.219	1.204	.985	.967	.899	.933	1.030	1.003	.850	-.485	-.473	65*	.999
.932	1.213	1.189	1.057	1.036	.729	.818	1.002	1.036	.932	-.462	-.463	66*	.986

*Lander body.

TABLE II.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS CLOSED - CONTINUED

(c) $M = 1.2$; $\phi_m = 0^\circ$

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^\circ$	$\phi = 30^\circ$	$\phi = 90^\circ$	$\phi = 120^\circ$	$\phi = 180^\circ$	$\phi = 210^\circ$	$\phi = 240^\circ$	$\phi = 270^\circ$		$\phi = 150^\circ$	$\phi = 180^\circ$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 0^\circ$													
.385	1.278	1.277	1.286	1.277		1.272		1.281	.385	-.256	-.292	61	1.392
.550	1.235	1.252	1.276	1.272	1.270	1.261	1.273	1.266	.550	-.286	-.279	62	1.400
.696	1.225	1.200	1.219	1.271	1.244	1.223	1.247	1.268	.696	-.279	-.276	63	1.390
.767	1.352	1.267	1.281	1.360	1.252	1.275	1.303	1.285	.767	-.279	-.276	64	1.368
.850	1.386	1.290	1.273	1.355	1.226	1.283	1.284	1.271	.850	-.267	-.260	65*	1.359
.932	1.346	1.354	1.385	1.386	1.134	1.374	1.365	1.386	.932	-.243	-.250	66*	1.351
$\alpha = 4^\circ$													
.385	1.251	1.253	1.267	1.288		1.266		1.258	.385	-.301	-.300	61	1.389
.550	1.251	1.251	1.258	1.279	1.299	1.268	1.265	1.251	.550	-.298	-.299	62	1.401
.696	1.253	1.265	1.260	1.278	1.299	1.238	1.257	1.252	.696	-.298	-.294	63	1.398
.767	1.260	1.241	1.286	1.392	1.301	1.317	1.286	1.296	.767	-.293	-.295	64	1.382
.850	1.269	1.252	1.318	1.348	1.232	1.350	1.281	1.337	.850	-.286	-.285	65*	1.384
.932	1.278	1.202	1.372	1.366	1.123	1.378	1.367	1.366	.932	-.261	-.280	66*	1.367
$\alpha = 6^\circ$													
.385	1.241	1.246	1.264	1.292		1.288		1.257	.385	-.301	-.303	61	1.387
.550	1.247	1.242	1.254	1.289	1.316	1.280	1.276	1.256	.550	-.303	-.303	62	1.403
.696	1.257	1.257	1.267	1.284	1.317	1.273	1.265	1.255	.696	-.300	-.299	63	1.400
.767	1.252	1.238	1.282	1.395	1.306	1.329	1.295	1.291	.767	-.296	-.297	64	1.387
.850	1.259	1.242	1.321	1.346	1.234	1.360	1.291	1.344	.850	-.298	-.288	65*	1.390
.932	1.215	1.174	1.368	1.356	1.106	1.381	1.365	1.356	.932	-.264	-.284	66*	1.372
$\alpha = 9^\circ$													
$\alpha = 16^\circ$													
.385	1.183	1.196	1.227	1.308		1.321		1.239	.385	-.356	-.355	61	1.358
.550	1.187	1.188	1.207	1.290	1.325	1.308	1.296	1.249	.550	-.356	-.353	62	1.388
.696	1.200	1.211	1.255	1.306	1.328	1.289	1.293	1.186	.696	-.353	-.354	63	1.399
.767	1.190	1.173	1.251	1.380	1.322	1.351	1.303	1.252	.767	-.354	-.354	64	1.403
.850	1.191	1.179	1.306	1.337	1.294	1.370	1.306	1.300	.850	-.351	-.353	65*	1.404
.932	1.088	1.075	1.311	1.311	1.294	1.383	1.353	1.311	.932	-.332	-.353	66*	1.395
$\alpha = 24^\circ$													
.385	1.117	1.096	1.212	1.300		1.358		1.212	.385	-.430	-.432	61	1.317
.550	1.136	1.132	1.204	1.305	1.334	1.325	1.317	1.192	.550	-.430	-.430	62	1.354
.696	1.148	1.167	1.201	1.289	1.334	1.361	1.318	1.199	.696	-.432	-.429	63	1.375
.767	1.134	1.113	1.196	1.355	1.373	1.384	1.317	1.175	.767	-.430	-.432	64	1.395
.850	1.129	1.125	1.249	1.322	1.367	1.389	1.315	1.251	.850	-.428	-.432	65*	1.404
.932	1.015	1.395	1.265	1.267	1.313	1.387	1.333	1.267	.932	-.406	-.430	66*	1.407

*Lander body.

TABLE II.- PRESSURE COEFFICIENTS FOR LANDER PLUS BASE COVER WITH DEORBIT-ATTITUDE CONTROL-SYSTEM NOZZLE PORTS CLOSED - CONCLUDED

(c) $M = 1.2$; $\phi_m = -180^\circ$ - Concluded

r/r_b	C_p for -								r/r_b	C_p for -		Orifice	C_p for -
	$\phi = 0^\circ$	$\phi = 30^\circ$	$\phi = 90^\circ$	$\phi = 120^\circ$	$\phi = 180^\circ$	$\phi = 210^\circ$	$\phi = 240^\circ$	$\phi = 270^\circ$		$\phi = 150^\circ$	$\phi = 180^\circ$		Terminal descent landing radar
	Windward face								Leeward face				
$\alpha = 0^\circ$													
.385	1.273	1.275	1.283	1.283		1.269		1.283	.385	-.294	-.288	61	1.396
.550	1.234	1.249	1.278	1.274	1.273	1.260	1.281	1.269	.550	-.283	-.283	62	1.403
.696	1.225	1.204	1.227	1.272	1.245	1.239	1.256	1.275	.696	-.284	-.280	63	1.392
.767	1.352	1.269	1.280	1.362	1.250	1.280	1.309	1.289	.767	-.282	-.279	64	1.359
.850	1.395	1.291	1.259	1.359	1.224	1.283	1.289	1.276	.850	-.276	-.275	65*	1.365
.932	1.347	1.359	1.388	1.387	1.131	1.375	1.368	1.387	.932	-.252	-.266	66*	1.357
$\alpha = 4^\circ$													
.385	1.307	1.298	1.289	1.271		1.278		1.286	.385	-.274	-.250	61	1.392
.550	1.251	1.260	1.275	1.267	1.265	1.267	1.294	1.275	.550	-.258	-.239	62	1.402
.696	1.331	1.249	1.289	1.265	1.258	1.263	1.273	1.272	.696	-.256	-.231	63	1.395
.767	1.382	1.330	1.280	1.339	1.249	1.261	1.315	1.279	.767	-.254	-.227	64	1.369
.850	1.398	1.369	1.219	1.357	1.230	1.223	1.295	1.227	.850	-.246	-.215	65*	1.347
.932	1.354	1.360	1.299	1.337	1.112	1.325	1.371	1.337	.932	-.222	-.210	66*	1.340
$\alpha = 6^\circ$													
.385	1.320	1.310	1.287	1.267		1.277		1.283	.385	-.285	-.267	61	1.390
.550	1.264	1.272	1.258	1.280	1.259	1.262	1.290	1.269	.550	-.274	-.259	62	1.405
.696	1.352	1.286	1.273	1.286	1.247	1.259	1.288	1.276	.696	-.268	-.248	63	1.400
.767	1.388	1.350	1.274	1.307	1.237	1.251	1.308	1.279	.767	-.264	-.243	64	1.377
.850	1.400	1.380	1.265	1.324	1.224	1.223	1.298	1.187	.850	-.260	-.233	65*	1.339
.932	1.361	1.361	1.211	1.249	1.104	1.252	1.362	1.249	.932	-.234	-.225	66*	1.327
$\alpha = 9^\circ$													
.385	1.336	1.329	1.285	1.247		1.269		1.284	.385	-.301	-.295	61	1.385
.550	1.288	1.292	1.249	1.265	1.240	1.252	1.279	1.259	.550	-.297	-.289	62	1.402
.696	1.357	1.322	1.252	1.253	1.231	1.246	1.295	1.275	.696	-.292	-.281	63	1.404
.767	1.387	1.363	1.244	1.305	1.221	1.240	1.301	1.273	.767	-.285	-.271	64	1.387
.850	1.400	1.383	1.240	1.325	1.206	1.221	1.301	1.252	.850	-.278	-.265	65*	1.324
.932	1.365	1.359	1.212	1.197	1.085	1.172	1.350	1.197	.932	-.256	-.254	66*	1.308
$\alpha = 16^\circ$													
.385	1.362	1.356	1.273	1.215		1.249		1.269	.385	-.359	-.356	61	1.365
.550	1.341	1.340	1.220	1.227	1.218	1.222	1.258	1.248	.550	-.359	-.354	62	1.392
.696	1.376	1.376	1.220	1.313	1.191	1.219	1.263	1.264	.696	-.357	-.355	63	1.403
.767	1.394	1.381	1.176	1.273	1.186	1.201	1.268	1.230	.767	-.351	-.346	64	1.403
.850	1.398	1.390	1.208	1.281	1.158	1.186	1.288	1.211	.850	-.342	-.334	65*	1.277
.932	1.381	1.364	1.193	1.160	1.028	1.078	1.317	1.160	.932	-.319	-.327	66*	1.259
$\alpha = 24^\circ$													
.385	1.353	1.348	1.249	1.177		1.219		1.247	.385	-.429	-.429	61	1.318
.550	1.360	1.349	1.188	1.151	1.172	1.182	1.208	1.224	.550	-.430	-.430	62	1.358
.696	1.382	1.380	1.162	1.277	1.146	1.181	1.209	1.221	.696	-.433	-.435	63	1.379
.767	1.397	1.387	1.141	1.182	1.129	1.147	1.190	1.191	.767	-.429	-.429	64	1.405
.850	1.396	1.387	1.190	1.187	1.115	1.145	1.233	1.205	.850	-.421	-.417	65*	1.213
.932	1.391	1.366	1.258	1.244	.964	1.040	1.210	1.244	.932	-.397	-.406	66*	1.198

*Lander body.

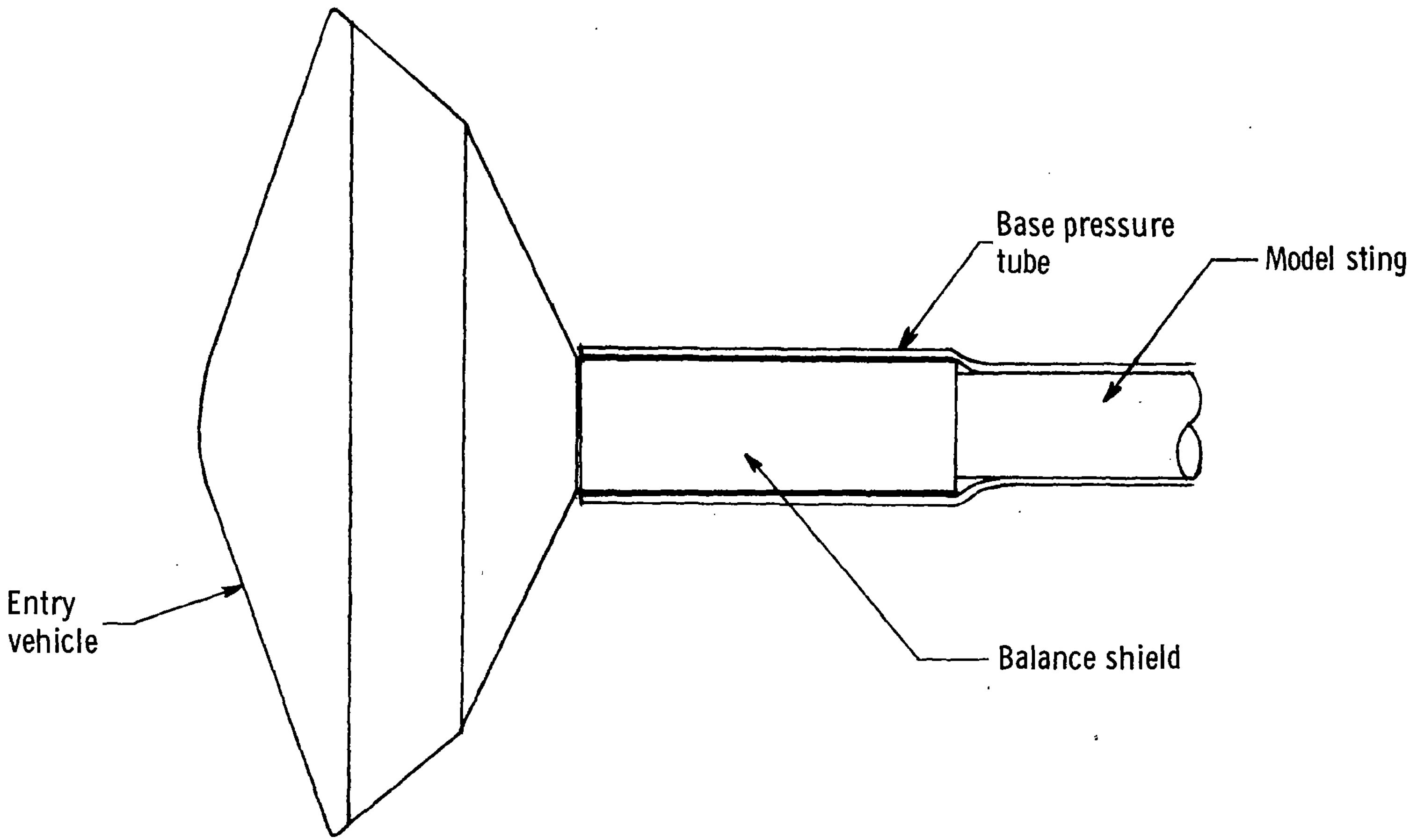


Figure 1.- Typical force-test tunnel installation.

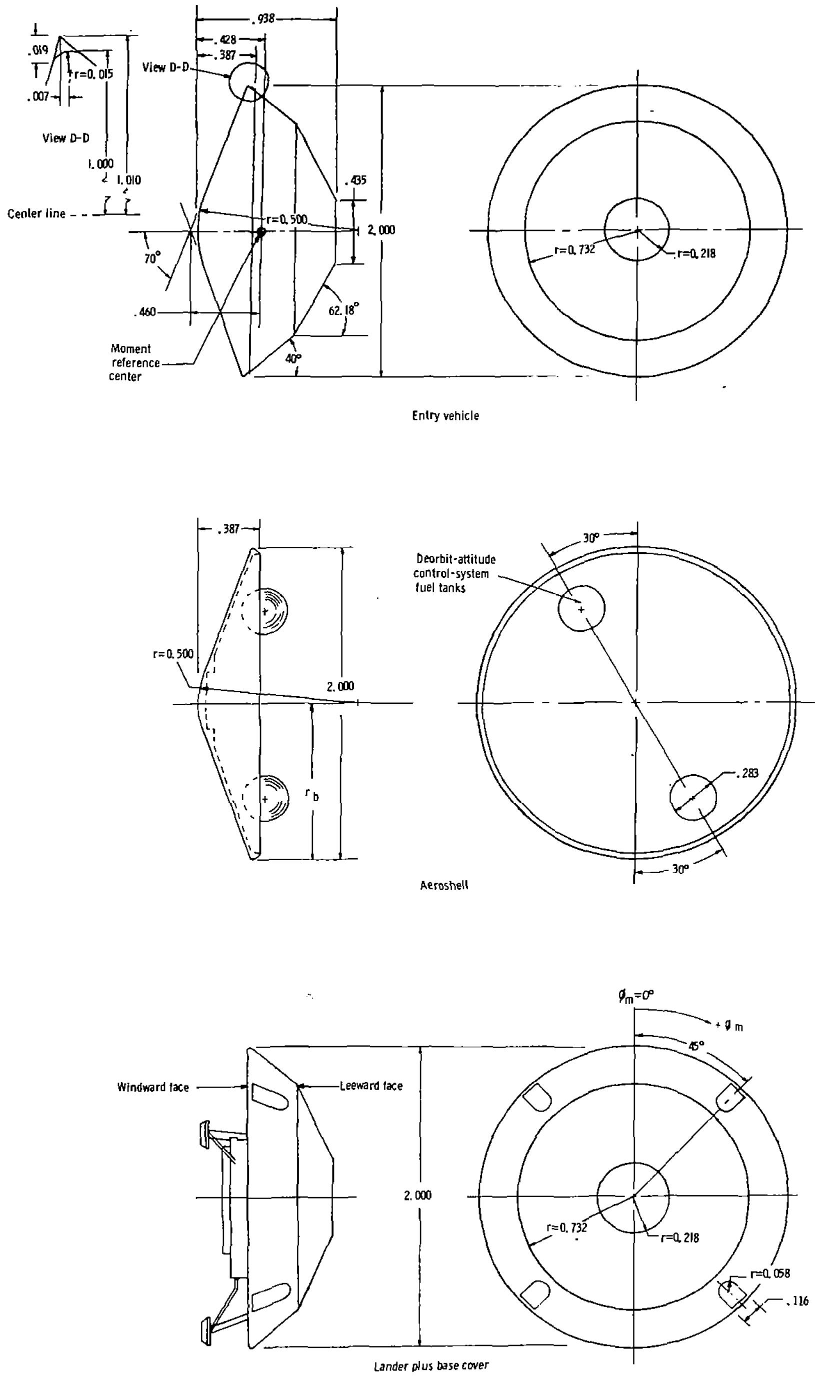
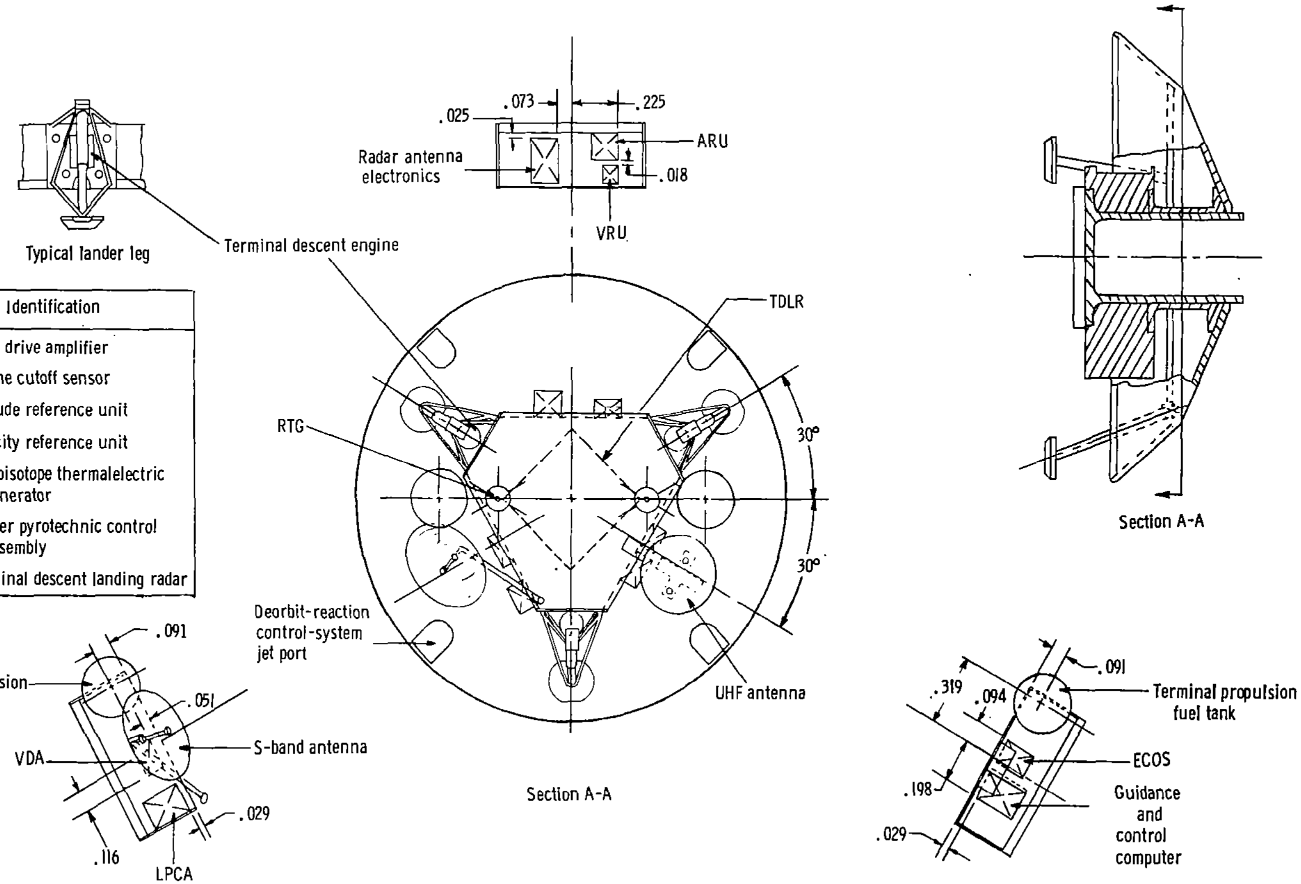


Figure 2.- Force models. All dimensions in terms of maximum model radius. r_b = 14.02 cm.



Lander component	Identification
VDA	Valve drive amplifier
ECOS	Engine cutoff sensor
ARU	Attitude reference unit
VRU	Velocity reference unit
RTG	Radioisotope thermalelectric generator
LPCA	Lander pyrotechnic control assembly
TDLR	Terminal descent landing radar

Figure 3.- Details of the lander plus base cover. All dimensions in terms of maximum model radius. $r_b = 14.02$ cm.

Orifice No. (typ.)	Radius, r/r_b
1	0.932
2	.850
3	.767
4	.696
5	.550
6	.385

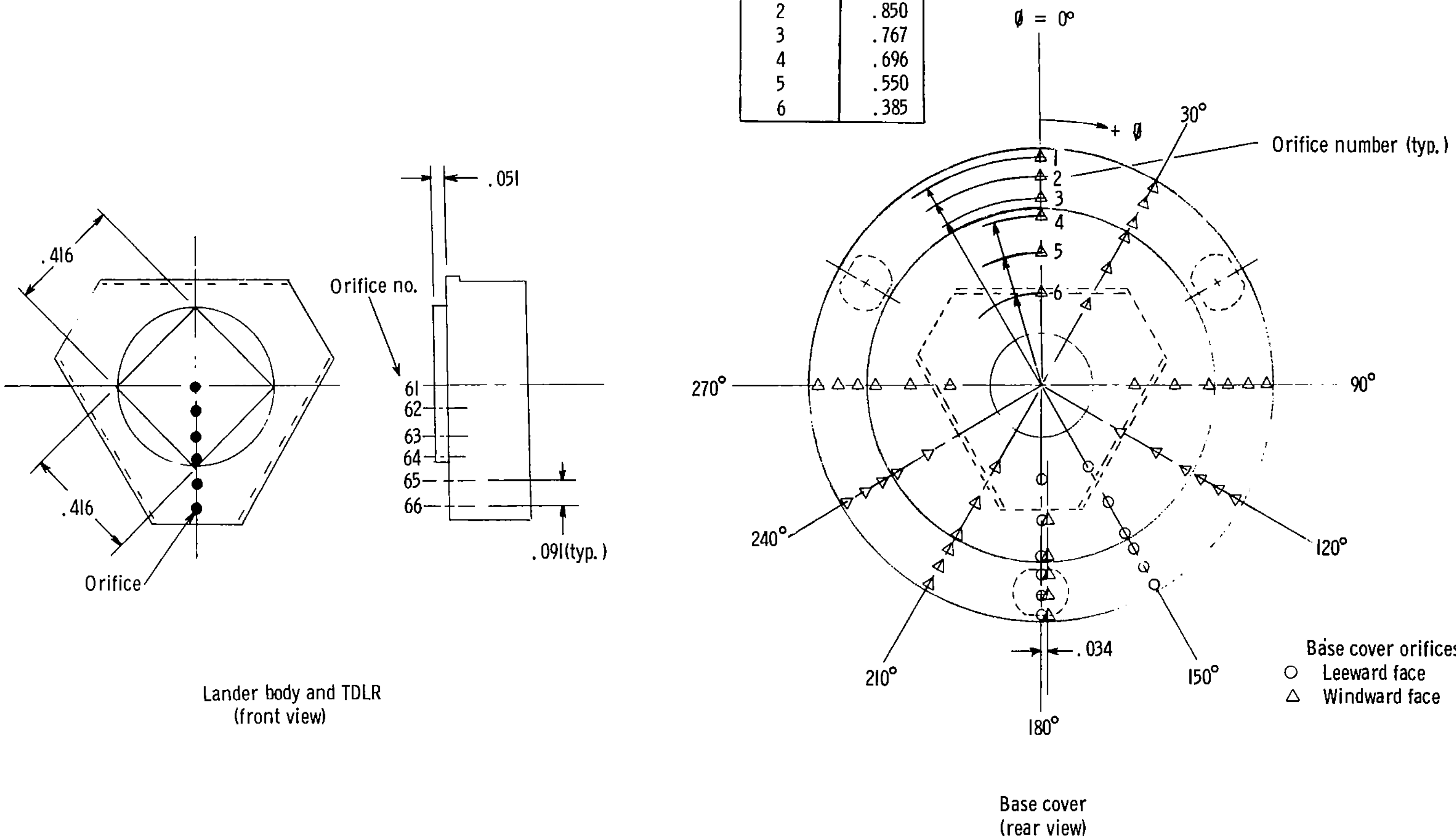
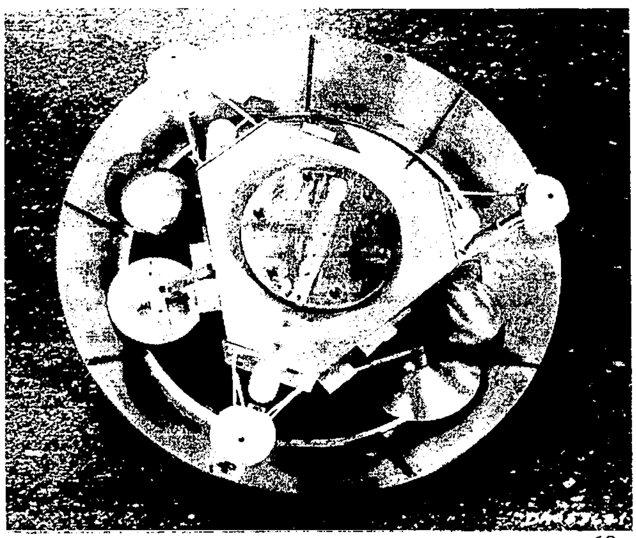


Figure 4.- Location of orifices on pressure model of lander plus base cover. All dimensions in terms of maximum model radius. r_b = 14.02 cm.

(a) Entry vehicle.



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(b) Lander plus base cover.

Figure 5.- Viking entry vehicle and lander plus base cover.

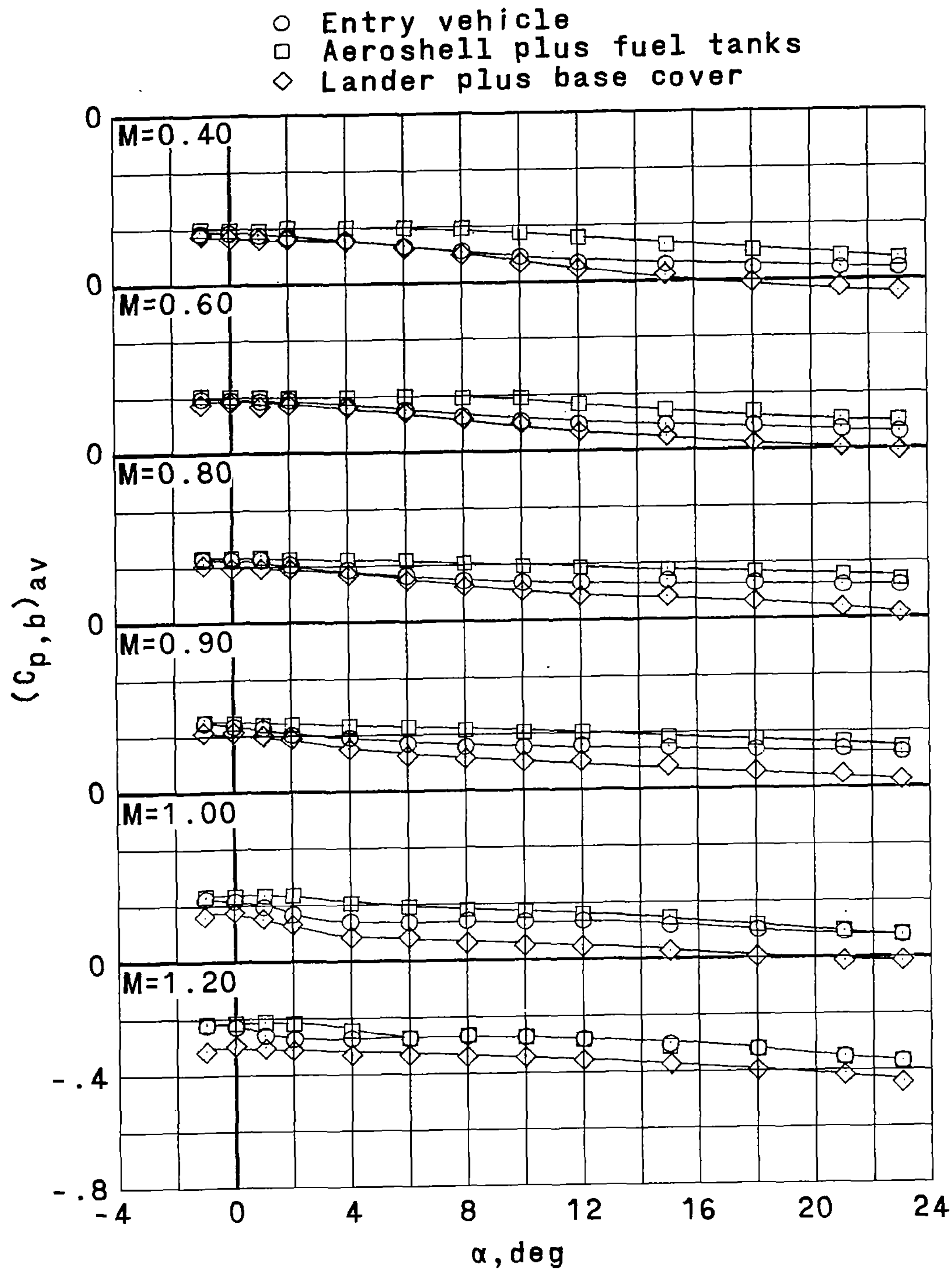


Figure 6.- Variation of average base pressure coefficient with angle of attack for force tests. $\phi_m = 0^{\circ}$.

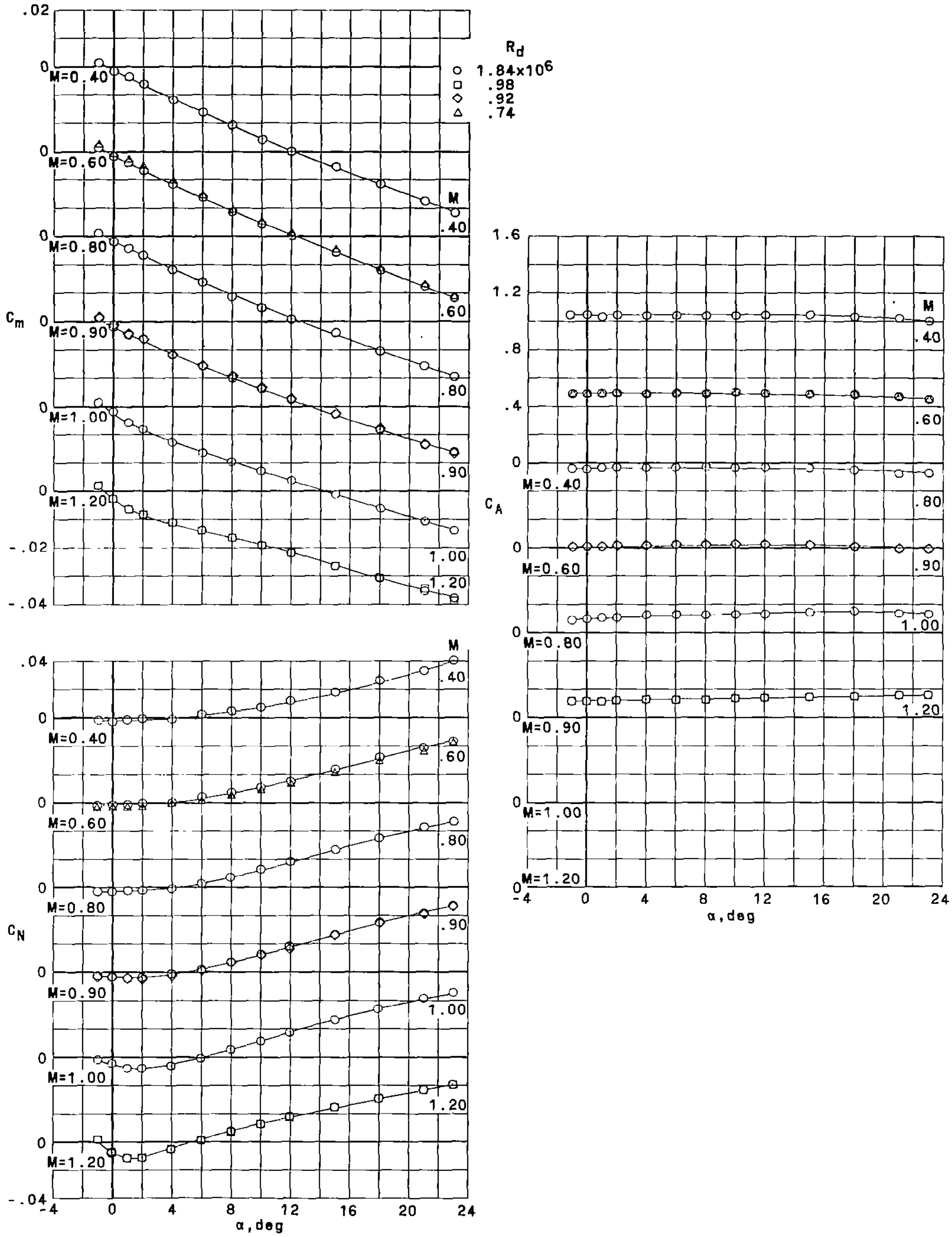


Figure 7.- Variation of normal-force coefficient, pitching-moment coefficient, and axial-force coefficient with angle of attack for entry vehicle.

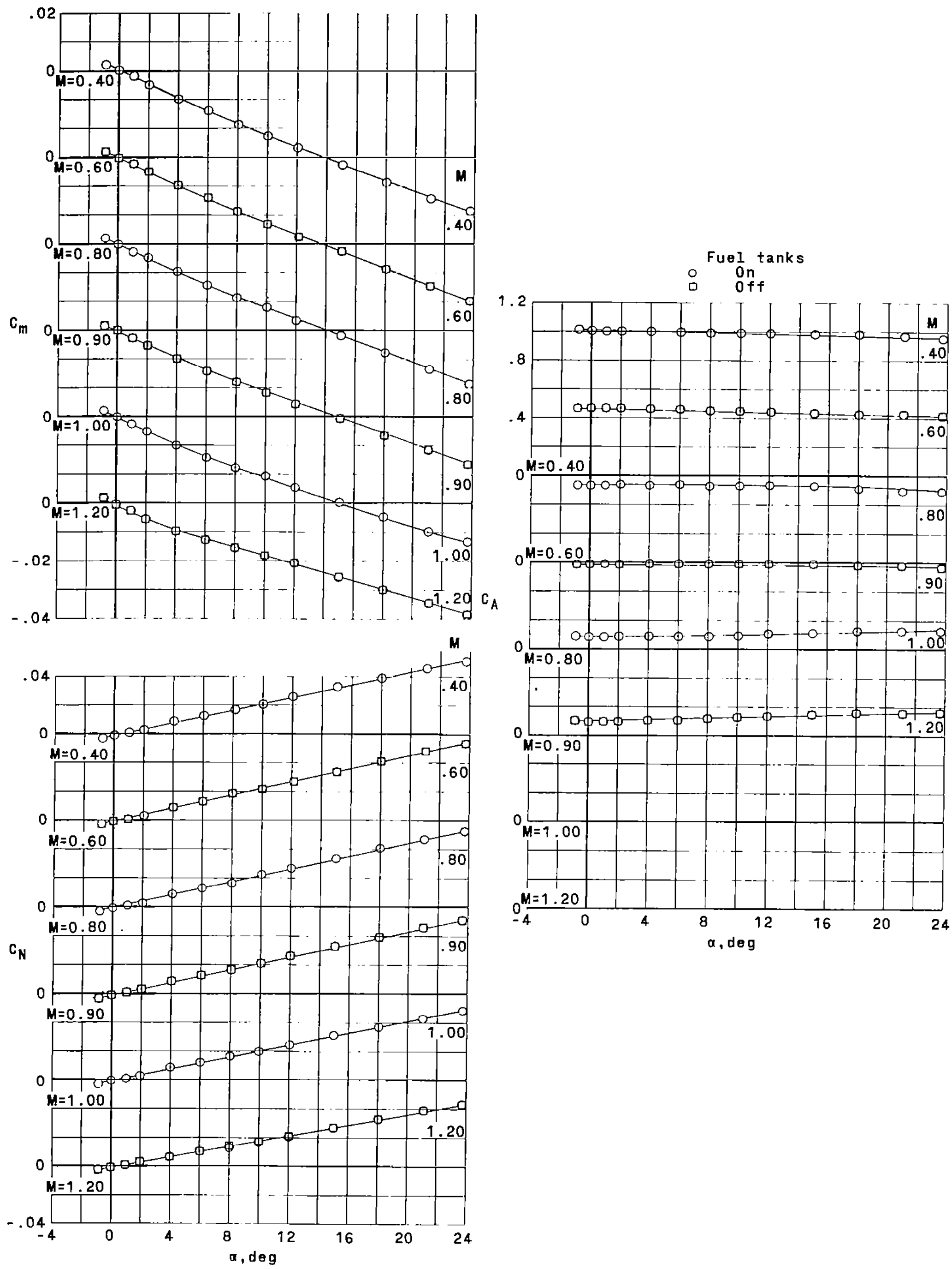
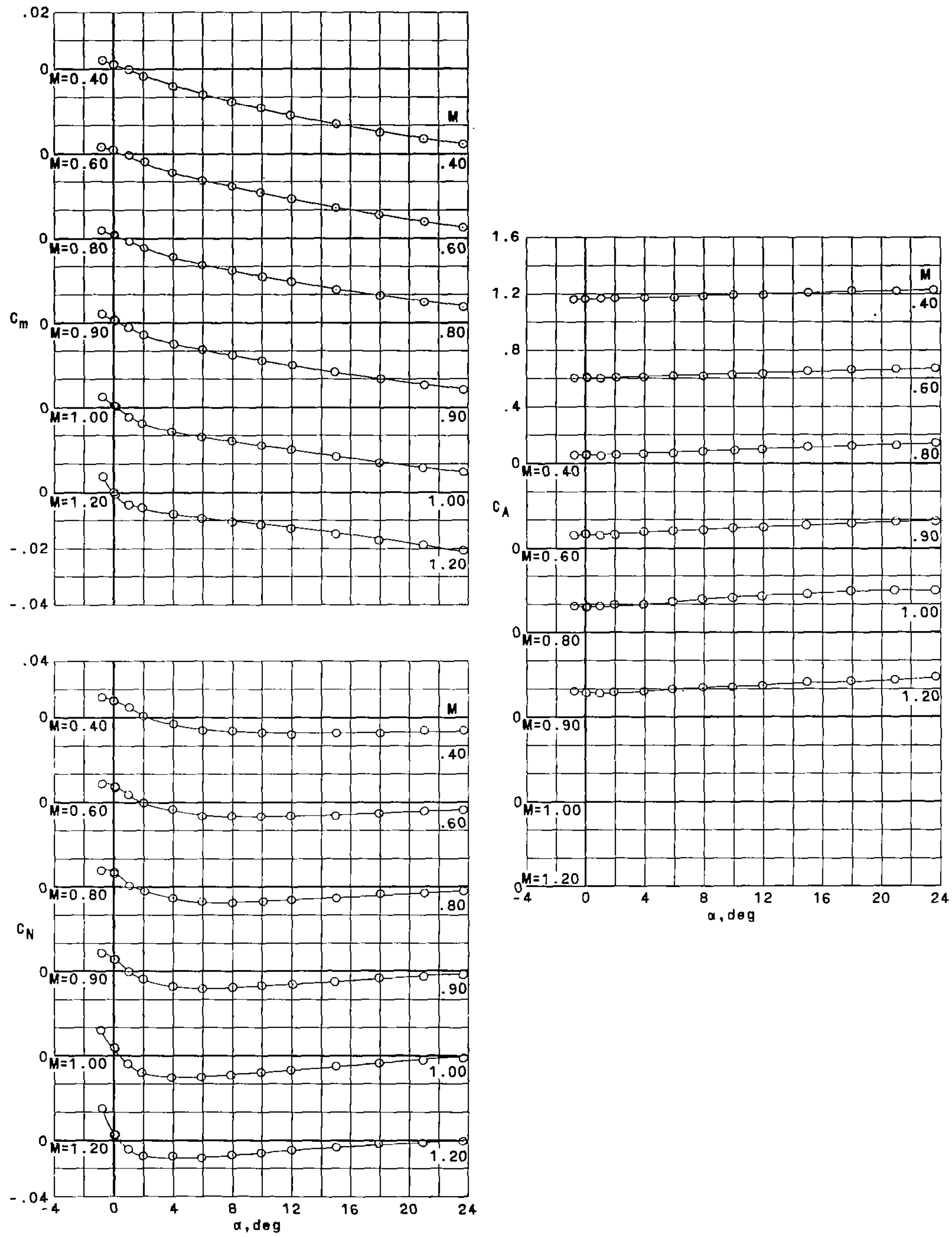
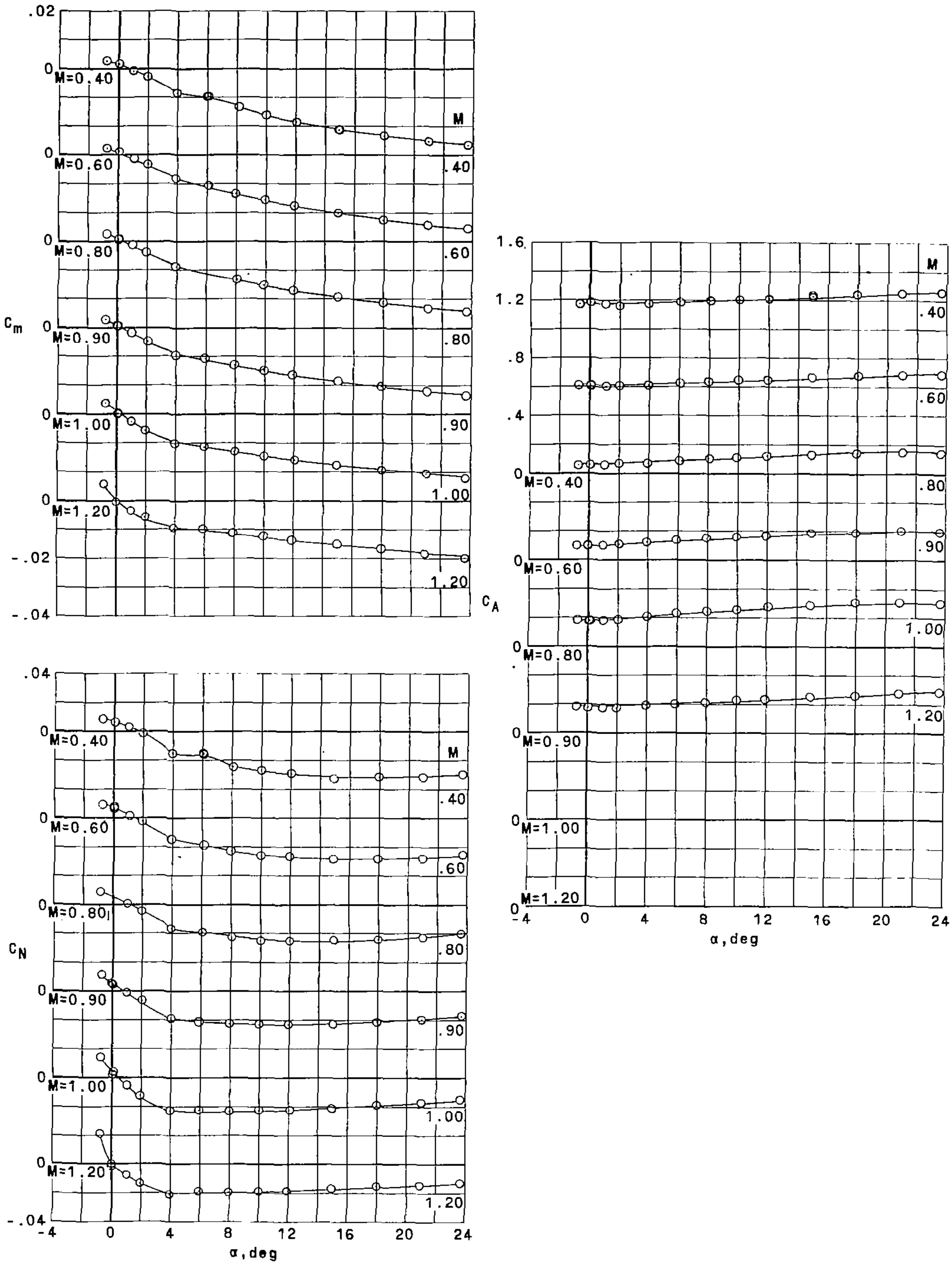


Figure 8.- Variation of normal-force coefficient, pitching-moment coefficient, and axial-force coefficient with angle of attack for aeroshell. $R_d = 1.84 \times 10^6$.



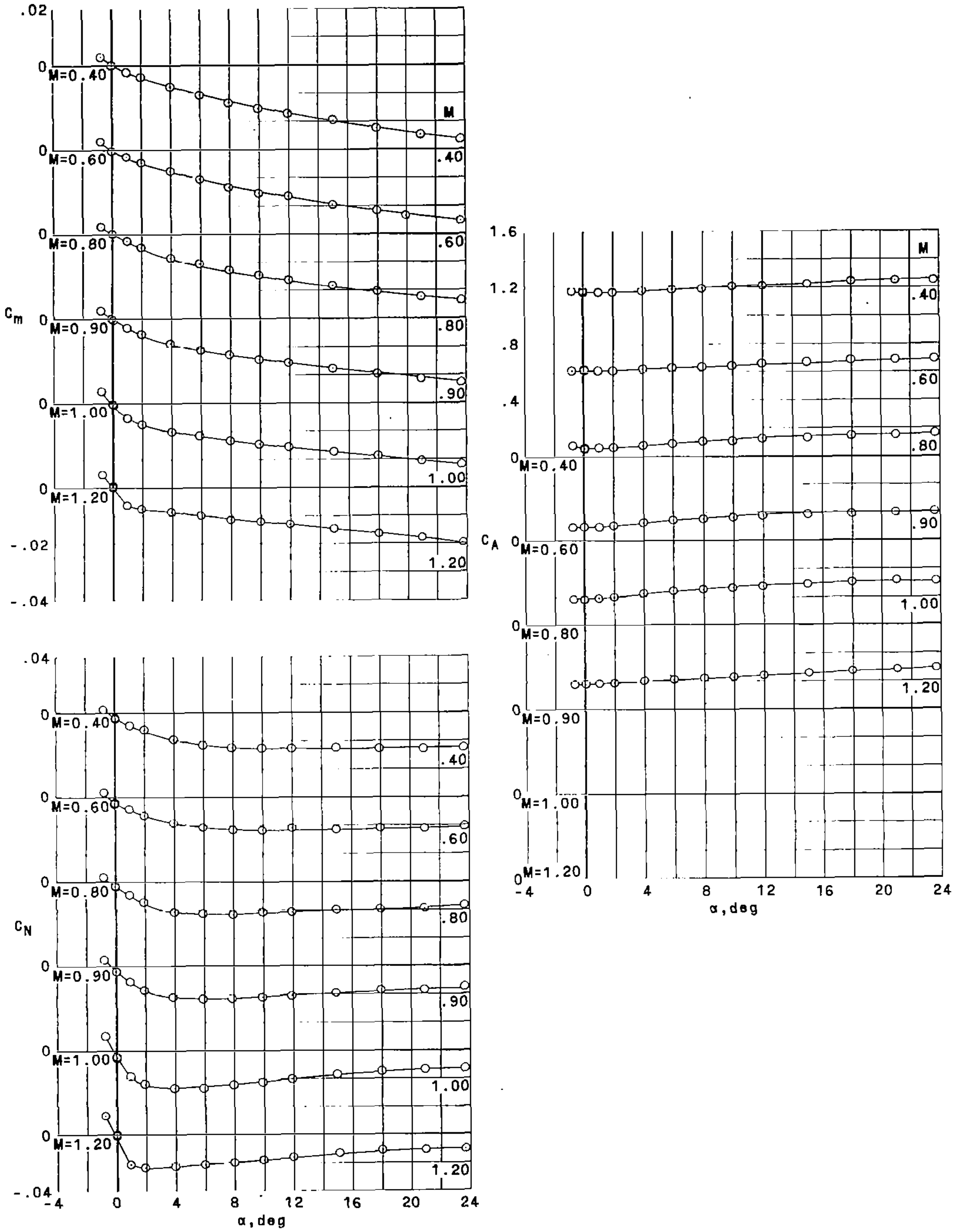
(a) $\phi_m = 0^\circ$.

Figure 9.- Variation of normal-force coefficient, pitching-moment coefficient, and axial-force coefficient with angle of attack for lander plus base cover. $R_d = 1.84 \times 10^6$.



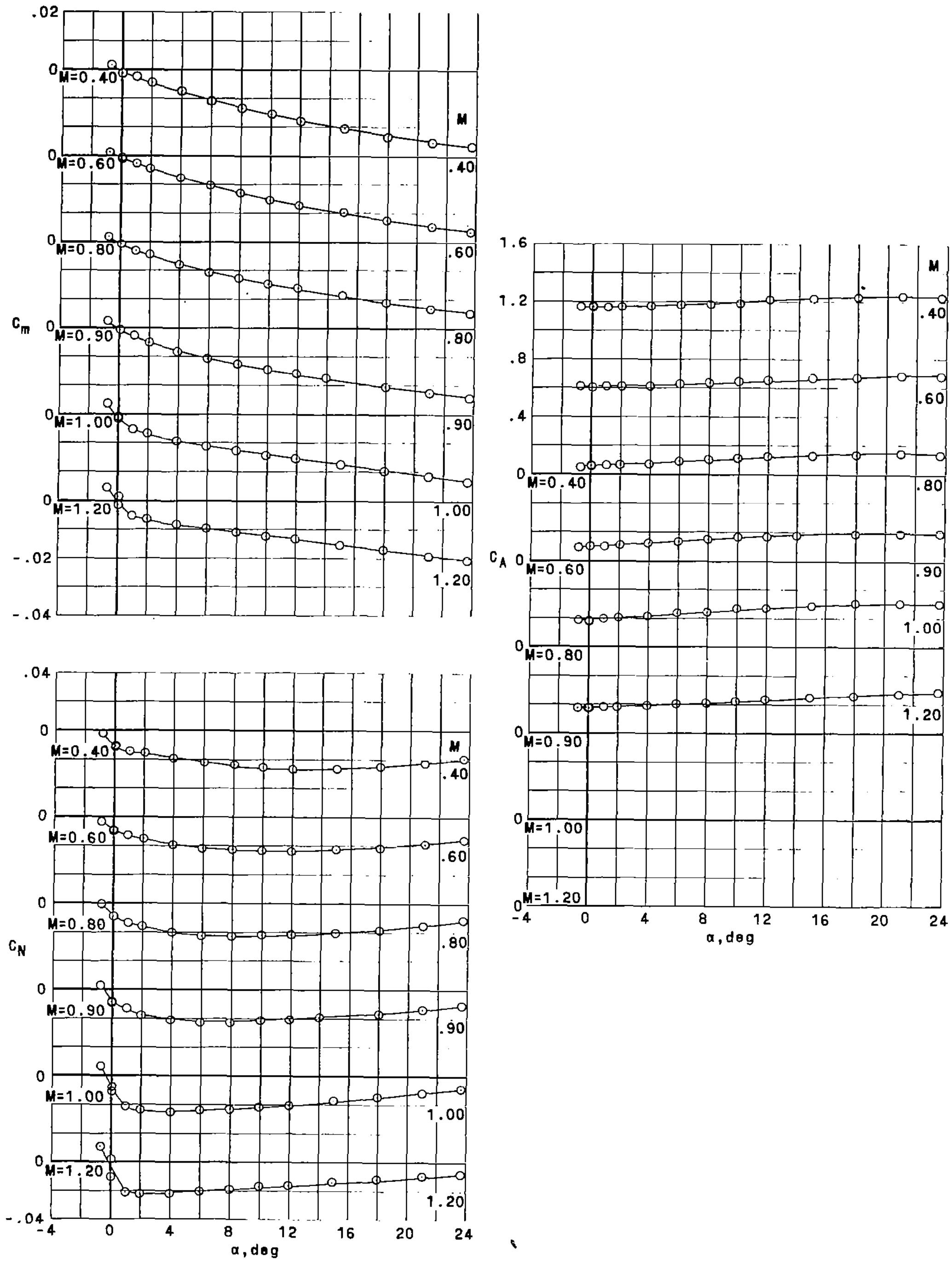
(b) $\phi_m = -60^\circ$.

Figure 9.- Continued.



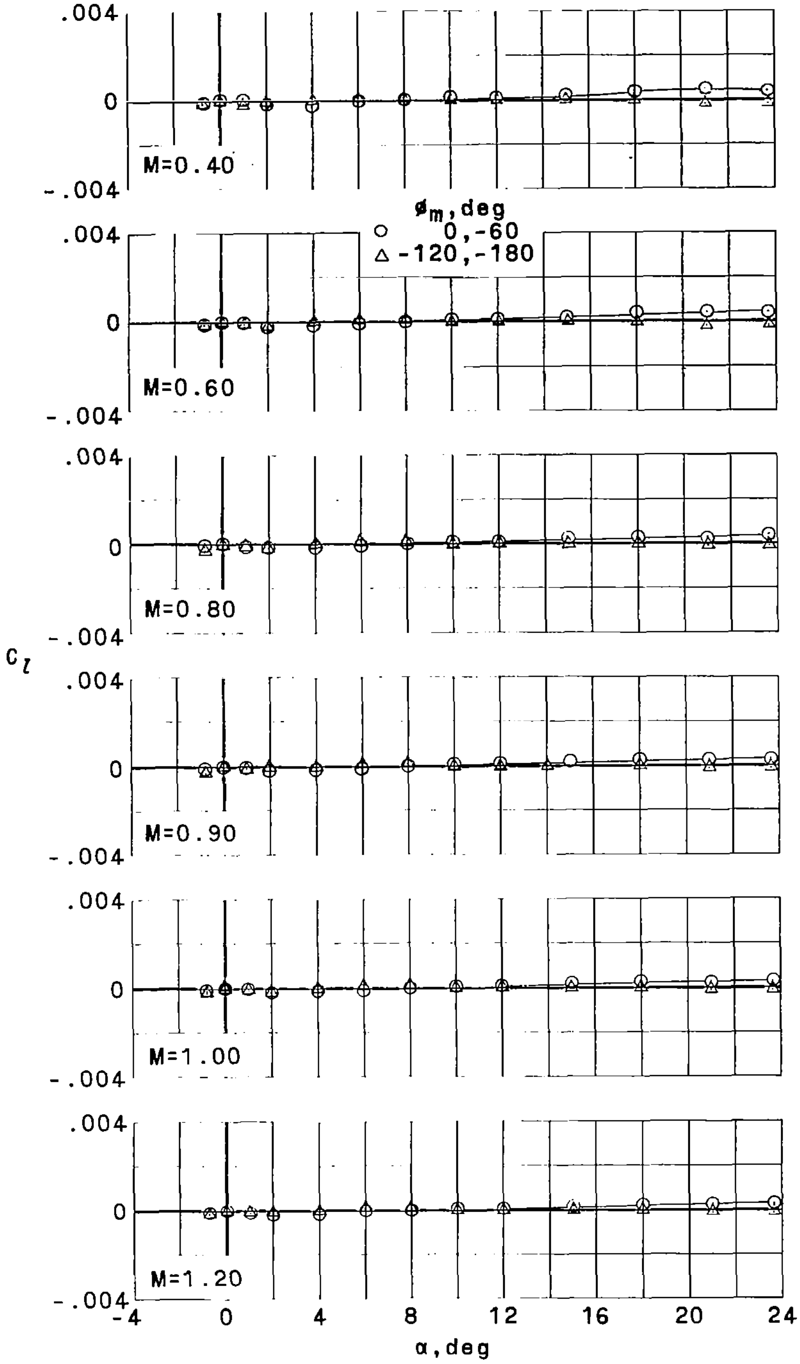
(c) $\phi_m = -120^{\circ}$.

Figure 9.- Continued.



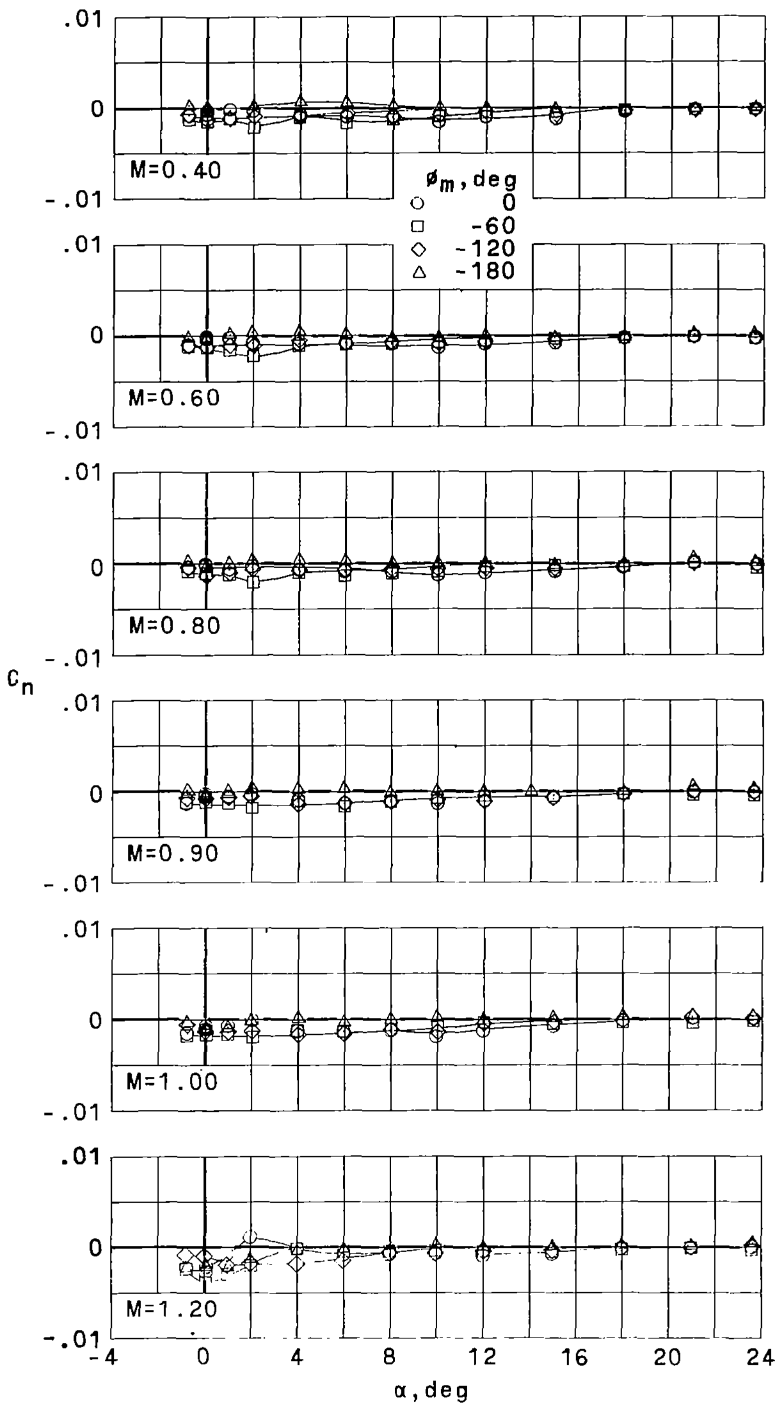
(d) $\phi_m = -180°$.

Figure 9.- Concluded.



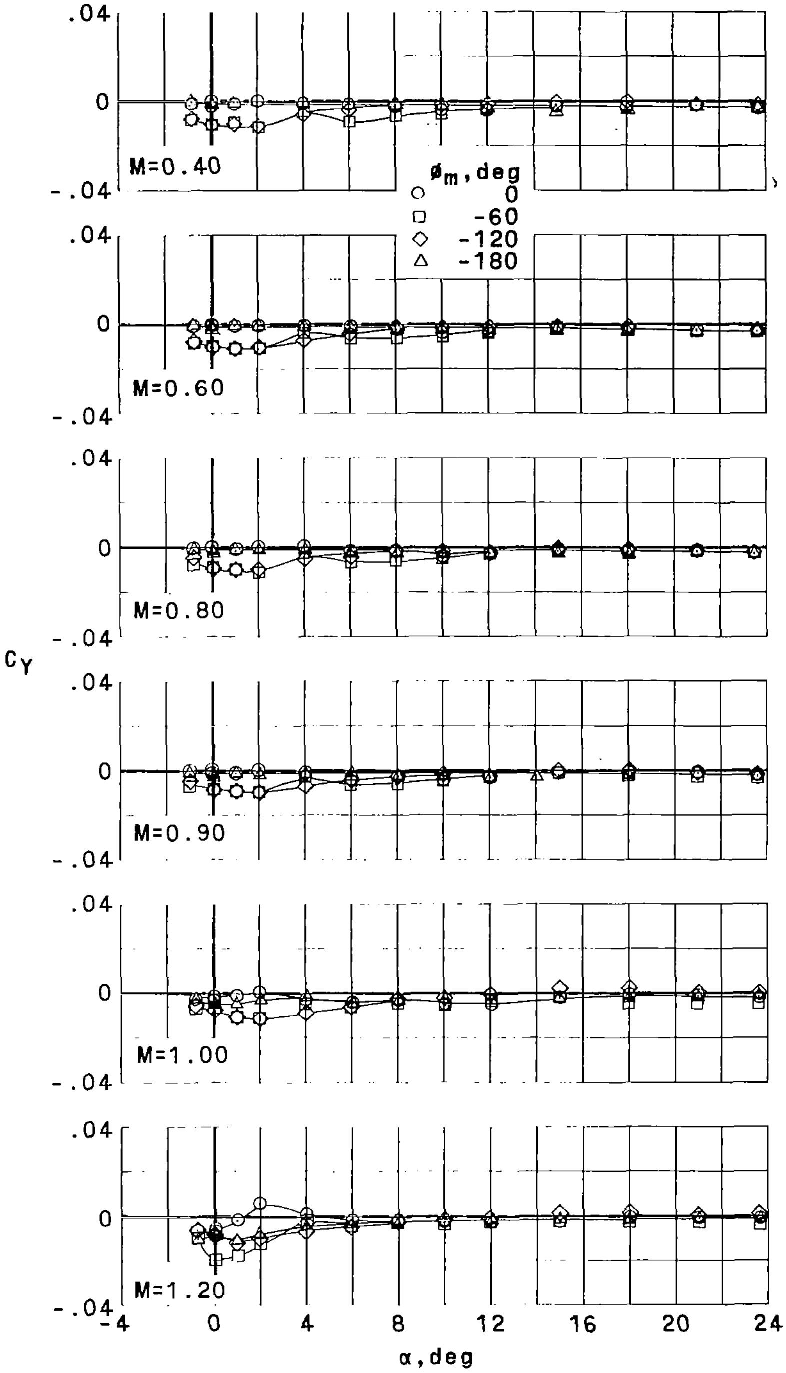
(a) Rolling-moment coefficient.

Figure 10.- Variation of rolling-moment coefficient, yawing-moment coefficient, and side-force coefficient with angle of attack for lander plus base cover. $R_d = 1.84 \times 10^6$.



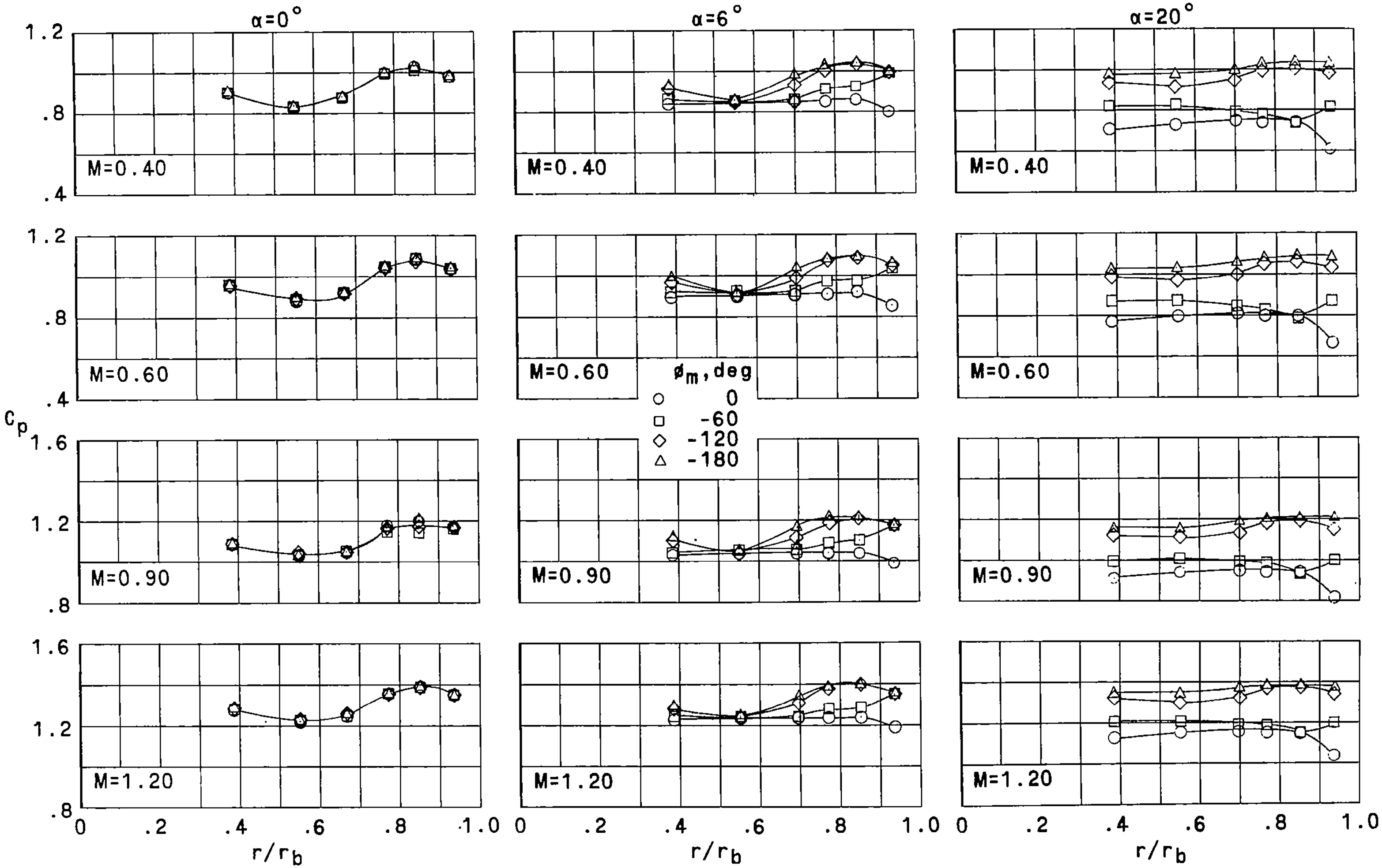
(b) Yawing-moment coefficient.

Figure 10.- Continued.



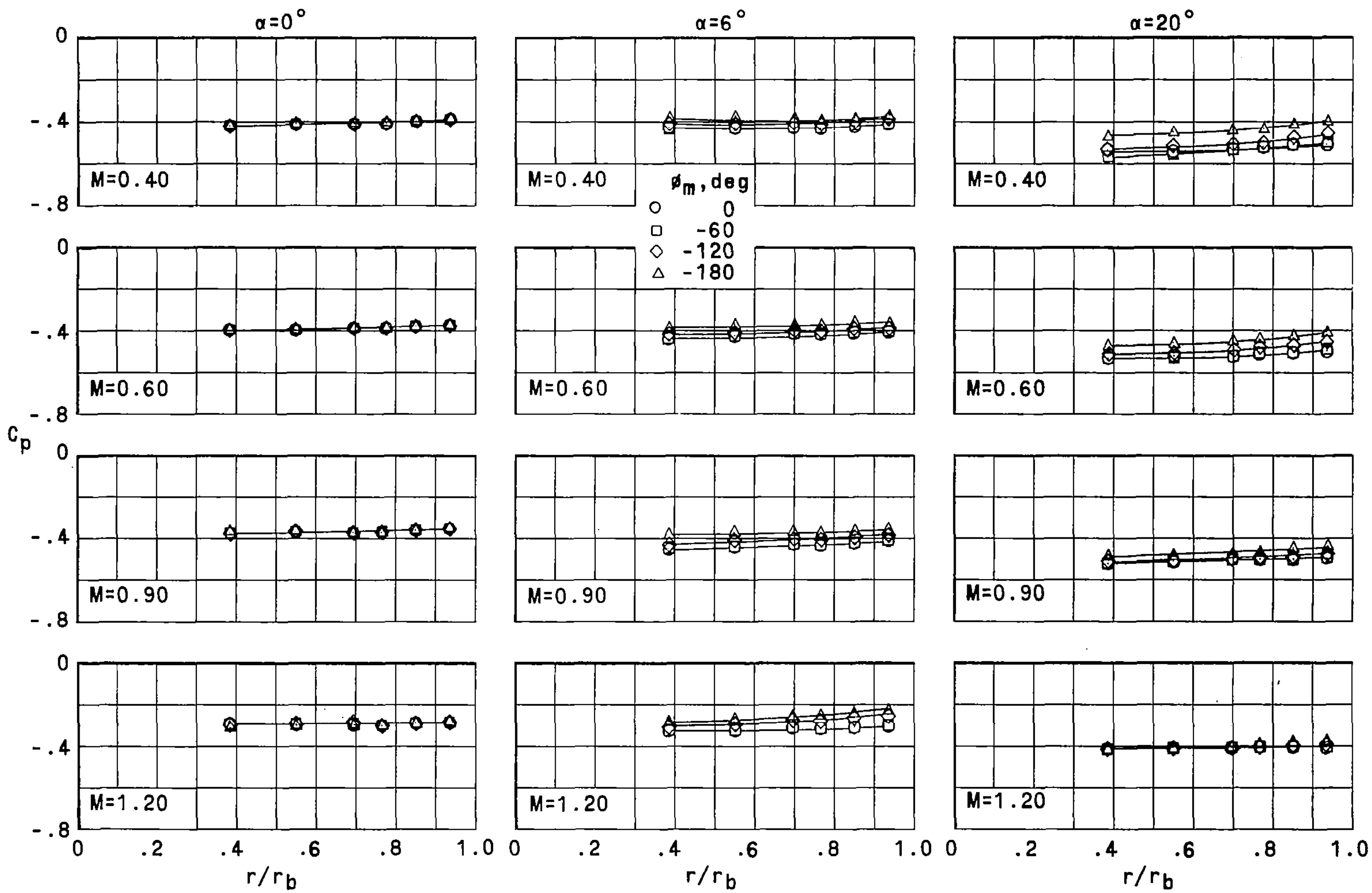
(c) Side-force coefficient.

Figure 10.- Concluded.



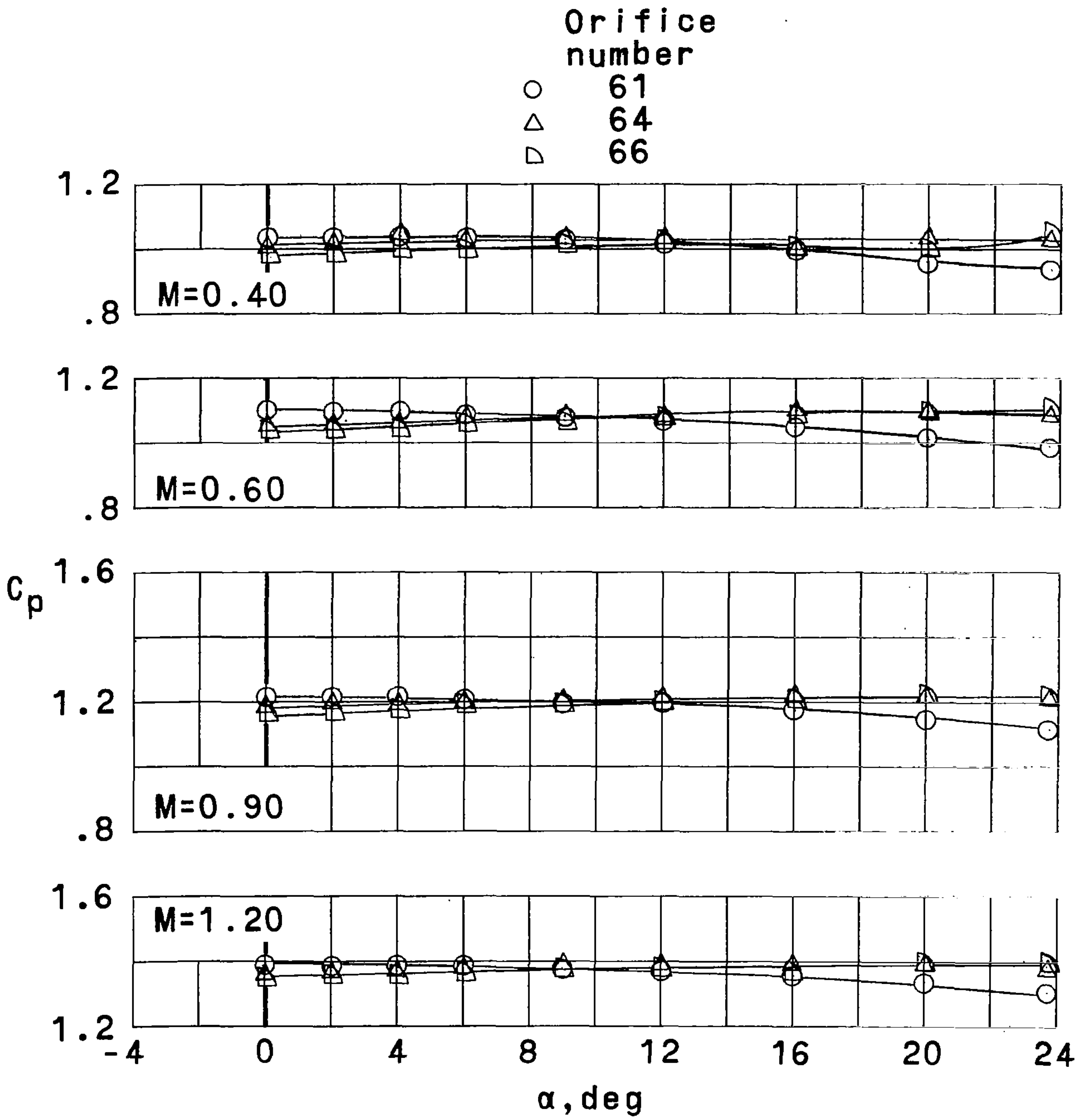
(a) $\phi = 0^{\circ}$; windward face.

Figure 11.- Pressure distribution on lander plus base cover. $R_d = 1.38 \times 10^6$.



(b) $\phi = 180^{\circ}$; leeward face.

Figure 11.- Continued.



(c) $\phi_m = 0^{\circ}$; lander body and TDLR.

Figure 11.- Concluded.

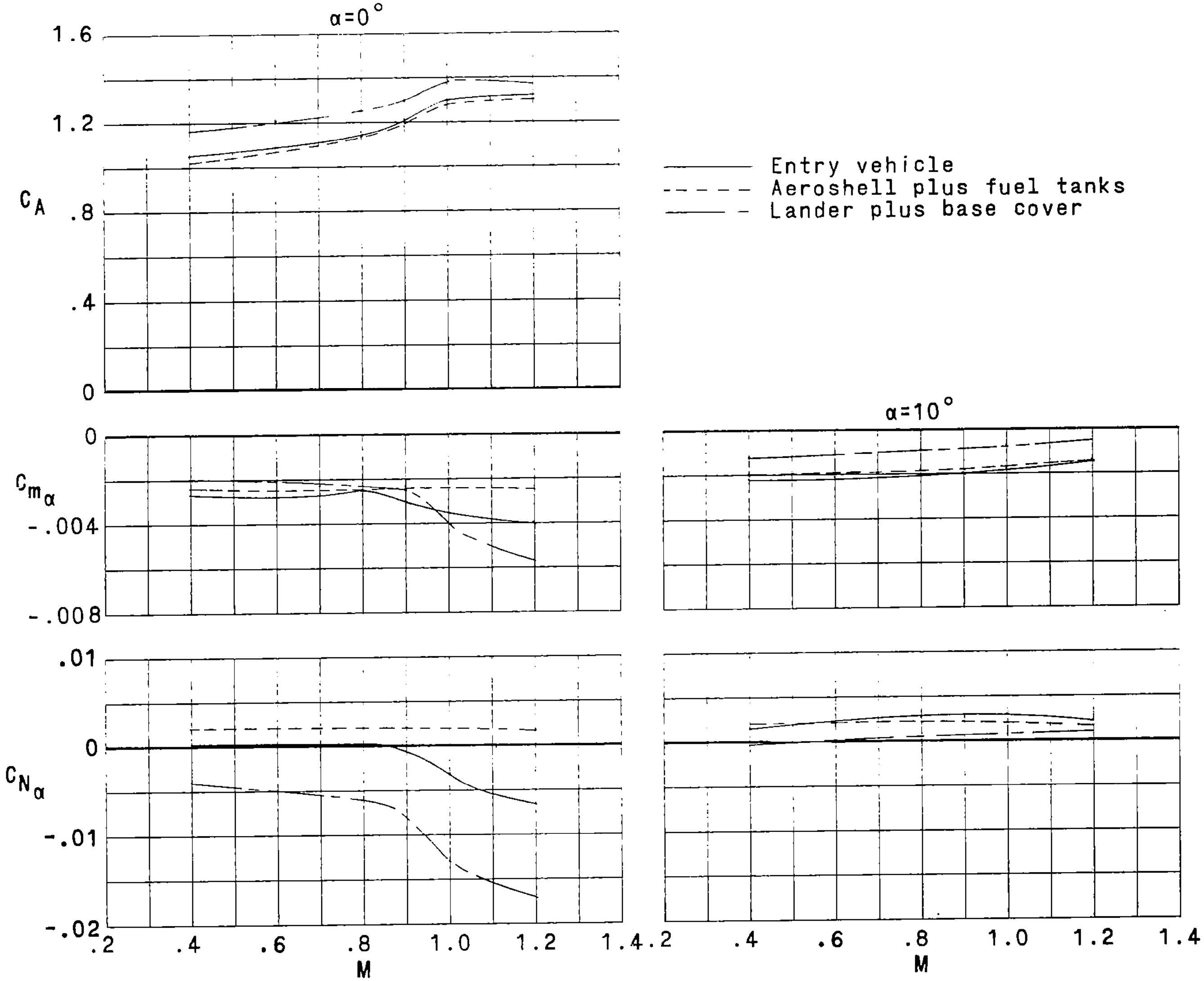


Figure 12.- Summary of static longitudinal aerodynamic characteristics. $\phi_m = 0^{\circ}$.

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